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Factors affecting faculty attitudes towards distance teaching

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Factors affecting faculty attitudes towards distance teaching

by

Kathleen Anne Stinehart

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CHAPTER I. INTRODUCTION

A major movement in higher education in the United States today is the increasing use of communications technologies to teach students at a distance from the campus. A number of societal developments are prompting postsecondary institutions to reach out to those older learners interested in postsecondary education but who are unable to attend campus-based classes due to geographic or time constraints. "Distance education," therefore, has enjoyed increasing usage over the past two decades as efforts on the part of many postsecondary institutions to meet the educational needs of adult students begin to synthesize with the development of instructional telecommunications system.

The literature provides evidence of ongoing growth in distance education as well as continued growth in the student cohort making the most use of this type of postsecondary learning. Taken together, these growth patterns indicate a need for increasing numbers of faculty members to teach students at a distance from college campuses. However, the available literature on faculty attitudes toward distance education and the use of instructional communications technologies is largely a chronicle of faculty resistance. It is this contra-indication in the literature--the coupling of faculty resistance to communication technologies with the documented need for increased levels of distance education programming--that has prompted this study.

Statement of the Problem

The purpose of this study is to measure which of the personal, operational, and organizational factors uncovered by research to date most strongly influence faculty members' participation in distance education. Although the literature has generated some descriptive data on faculty attitudes towards distance teaching--both positive and negative--no study has been made of the relative influence of the various attitudinal factors involved. Further, no attempts have been made to identify those factors which may trigger initial participation in distance teaching. Therefore, the overall research question guiding this study is: Which of the various factors revealed by the research to date carry the most weight in influencing faculty participation in distance teaching?

Two specific sub-questions focus the study: 1) Do faculty primarily resist distance teaching because the process of teaching via instructional technology is seen as lessening instructor control over the teaching-learning process? and, 2) Does institutional support constitute the strongest catalyst for participation in distance teaching? The thesis that instructional technology reduces instructor control over the teaching-learning process emanates from Heinich's (1984) work in the area of infusion of instructional technology into educational institutions. Heinich states that instructional technologies disturb the "power relationships" inherent in the traditional classroom teaching role by reducing the instructor's control over day-to day instruction, disturbing the traditional relationship between

curriculum and instruction, and bringing nonteaching professionals into the instructional planning process. A more complete discussion of Heinich's thesis, including his ideas on institutional support for distance education, appears in Chapter II as the theoretical framework underlying this study.

Definition of Terms

The term "distance education" generally refers to teaching and learning situations in which the instructor and the learner(s) are geographically separated, and which, therefore, rely on print, mechanical, or electronic devices to connect teachers with the students (Keegan, 1983; Holmberg, 1981; Sewert, 1982). Currently available definitions of distance education, however, vary in their specifics. Keegan, in 1983, surveyed definitions offered by various scholars and found six characteristics most held in common: 1) geographical separation of the teacher and student; 2) use of technical media; 3) influence of an educational organization, especially in the planning and preparation of learning materials; 4) provision of two-way communication between teacher and learner; 5) the possibility of face-to-face seminars built into the learning structure; and 6) industrialization as the overall form of education. Keegan's first characteristic distinguishes distance education from the use of instructional media in the classroom setting. His third characteristic distinguishes distance education from individual-self-guided study. His fourth common characteristic distinguishes distance education from mass media distribution

of information, such as that found in general education broadcasting. It is this fourth Keegan characteristic, that of a teacher-learner "feedback loop," that is most frequently cited as the qualifying distance education characteristic by other authors. For example, Holmberg (1981), whose work was included in Keegan's study, defines distance education as a "mediated form of guided didactic conversation," and stresses the importance of developing a "learning conversation" between the learner and the teacher. Keegan's sixth-listed characteristic refers to the division of labor frequently occurring in distance education systems, whereby the instructor takes the primary responsibility for effecting and evaluating student learning, but other professional staff persons are frequently responsible for disseminating the learning materials, tracking student lesson completion, scheduling media use, and so forth. Nonteaching professional staff may or may not also be involved in the design and creation of the mediated learning materials used.

Many scholars (e.g., Holmberg, 1981) limit the definition of distance education to teaching-learning systems based on noncontiguous communication between the instructor and the learner--that is, print-based correspondence coursework, correspondence coursework utilizing audio or videotape supplements, and home-study packaged "telecourses" consisting of broadcast or taped video lessons and accompanying print materials. Others use distance education as more of an omnibus term, encompassing not only correspondence study but also instruction by radio and television and ". . . all learning-teaching arrangements

that are not face-to-face" (Wedemeyer, 1977, p. 2121). The latter definition is large enough to include the newer developments in instruction via telecommunications--such as live interactive audio and video teleconferencing--which retain separation of the learner and teacher in space but not in time.

In this study, the term "distance education" is used as a referent for all those systems in which geographical distance separates the instructor and the learner(s), two-way communication between the instructor and learner is present, electronic and/or print media are used to deliver all or part of the course content, and noninstructional support staff are engaged in the planning and arranging of the distance education program. The data-gathering portion of this study encompasses four distance education modes of instruction: broadcast telecourses, "candid classroom" videotaped courses, audio teleconferenced courses, and live satellite video courses. These formats are defined in Chapter III of the study.

The term "distance teaching" is used in this study to refer to the instructional part of the total process--specifically, activities engaged in by the faculty member working with distance students (Keegan, 1983).

"Distance learning" is used in this study to refer to the students' experiences in the total process. By extension, then, the term "distance education" encompasses both distance teaching and distance learning (Keegan, 1982).

Although distance education modes can be, and indeed are, used to reach all ages of learners, it is evident from the literature that the vast majority of distance teaching is designed to reach older adult students in search of postsecondary instruction (e.g., Daniel et al., 1982; Lewis, 1983). In turn, postsecondary distance education itself spans a number of learning program categories including professional continuing education, various forms of noncredit learning, and course-work bearing academic credit and/or complete degree programs--frequently referred to as continuing higher education (e.g., Daniel et al., 1982; Lewis, 1983). It is this final category that is the specific focus of this paper: distance continuing higher education.

Assumptions

As stated earlier, the theoretical framework for this study is taken from Heinich's (1984) work in the area of infusion of instructional technology into educational institutions. Heinich's two primary postulates are that 1) faculty, who are the education professionals most affected by developments in instructional technology, resist such technologies because they lessen the instructor control that is inherent in the traditional classroom teaching role; and 2) an institution-wide or systems approach is needed to effectively study ways of effecting instructional technology adoption. This systems approach would include such items as instructor attitudes and institutional support.

Therefore, an important assumption of this study is that the area of distance teaching must be supported by research emanating from its

own field. Related areas such as instructional media, continuing higher education, and telecommunications continue to contribute significantly toward a better understanding of distance education. However, the research base for distance teaching is ultimately dependent upon studies specifically focusing on distance education. This assumption has guided the selection and analysis of the literature reviewed for this study and also underlies the population selected for the study: It spans widely differing communications modes but has as its commonality the function of teaching at a distance.

Hypotheses

Heinich's (1984) first postulate, as described earlier, gives rise to the first research question for this study: Do faculty primarily resist distance teaching because the process of teaching through technology is seen as lessening instructor control over the teaching-learning process? Three specific hypotheses emanate from this research question.

H1 There is a significant ($p < .05$), positive predictive relationship between willingness to engage in distance teaching and perceptions regarding control over the teaching-learning process in distance teaching.

H2 After those factors relating to control of the teaching-learning process are accounted for, no other factors will have a significant ($p < .05$), predictive relationship with willingness to engage in distance teaching.

H3 Faculty not experienced in distance teaching who indicate reluctance to initiate participation in it will rate those factors relating to control of the teaching-learning process significantly ($p < .05$) less positively than will faculty willing to participate in distance teaching.

The second research question in this study relates to positive factors that may trigger participation in distance teaching and is based on a systems-wide approach (e.g., Heinich, 1984; Kerr, 1977; Gaff, 1975). It is: Does institutional support constitute the strongest catalyst for participation in distance teaching? Two hypotheses emanate from this research question.

H4 Faculty indicating willingness to initiate or continue with participation in distance teaching will rate those factors relating to institutional administrative support significantly ($p < .05$) more positively than will faculty indicating reluctance to initiate or continue with distance teaching.

H5 Faculty experienced in distance teaching who indicate willingness to continue participation in distance teaching will rate those factors relating to institutional staff services significantly ($p < .05$) more positively than will experienced faculty who indicate unwillingness to continue in distance teaching.

Design of the Study

Subjects

One hundred thirty-nine Iowa State University faculty members participated in the study. Sixty-nine were obtained from an Office of Continuing Education list of faculty who had participated in distance teaching within the past five years, and seventy were randomly selected from the remaining ranks of teaching faculty. Eliminated from the population were faculty whose primary assignments were in research, administration, or Cooperative Extension field work.

Instrumentation and data gathering procedures

The survey method of research was used, effected through an original data-gathering instrument developed by the researcher. The instrument listed factors affecting faculty attitudes toward distance teaching as revealed by the literature. Six categories of attitudinal factors were covered: awareness of distance teaching opportunities, logistical concerns, quality issues, the use of technology for instruction, institutional support, and faculty control over the teaching-learning process. The subjects rated the factors on a scale of 1 to 5 according to their level of agreement with the statement.

Data analysis

Responses were divided into four groups for parts of the analysis: (1) faculty experienced in distance teaching and willing to continue with distance instruction; (2) faculty experienced in distance teaching but not willing to continue with it; (3) faculty not experienced in distance teaching but willing to try it; and (4) faculty not experienced in distance teaching and not willing to try it. Tabulation of questionnaire data and cross-tabulations across several data categories yielded a number of descriptive analyses. In addition, inferential statistical procedures were used.

Hypotheses 1 and 2 were tested by stepwise multiple regression to first ascertain the predictive relationship between faculty members' willingness to engage in distance teaching, and their perception of

distance instruction's effect on faculty control over the teaching-learning process; and secondly, to compare the strength of the control of the teaching-learning process variable to the strength of the other independent variables on willingness to engage in distance teaching.

Hypotheses 3, 4 and 5 were tested using the t-test for independent samples to analyze mean differences on categories of factors between the groups specified in the hypotheses.

Limitations of the Study

The sample for this study is confined to faculty at Iowa State University and the data-gathering instrument relates to the distance teaching programs and organizational structure of Iowa State. Consequently, the views of faculty whose institutions offer other types of distance teaching opportunities, the views of faculty whose institutions do not participate in distance teaching at all, and the views of faculty employed by institutions who are solely distance teaching entities are not necessarily represented by this study.

Significance of the Study

The results of this study will contribute to distance education administrators' efforts to successfully engage talented faculty members in distance education instruction. In addition, the study should contribute analytical information on the personal, operational, and organizational factors affecting faculty participation in distance teaching and provide a basis for more definitive research in this critical area.

CHAPTER II. REVIEW OF RELATED LITERATURE

The literature related to distance teaching provides evidence of both ongoing growth in distance education and ongoing growth in older student demand for this type of postsecondary learning. It speculates on reasons for that growth. In addition, it provides insights as to the nature of faculty resistance to instructional communications technologies and yields some descriptive data on the positive and negative factors affecting faculty attitudes twoards distance teaching. The analysis of this literature, through the theoretical framework described at the end of the chapter, provides the basis for addressing the question: Which of the various factors revealed by research to date carry the most weight in influencing faculty participation in distance teaching.

Overall Growth of Postsecondary Distance Education

The distance teaching universities

Since distance teaching is a worldwide phenomenon, growth in distance education systems for adults is evident on an international scale. In the 1970s, a number of institutions were created for the sole purpose of providing education at a distance to adult learners. As reported by Rumble and Harry (1982), the enrollment growth over the

last decade in these "distance teaching universities," as they have come to be called, has been significant. Table 1 shows those enrollments.

Table 1. Enrollments in distance teaching universities

Institution	Enrollment		
Athabasca University	1975-75	=	726
Canada	1980-81	=	5,690
Central Broadcasting and Television University, China	1979	=	273,060
	1982	=	280,000
Universidad Estatal a Distancia, Costa Rica	1978	=	7,098
	1979	=	29,797
Fernuniversität West Germany	1975	=	1,304
	1981	=	36,596
Allama Iqbal Open University, Pakistan	1975-76	=	976
	1980-81	=	41,013
Universidad Nacional de Educación a Distancia, Spain	1973	=	11,400
	1979-80	=	45,146

In addition to the data shown in Table 1, we learn from Keegan (1982) that the British Open University, perhaps the best known of the distance teaching institutions, garnered over 400,000 undergraduate applications for study in the decade of 1971-1980. As of 1982, 70,000 students had been accepted for enrollment and 40,000 had graduated with a baccalaureate degree. Other international indicators of growth include a tripling of the number of correspondence institutions in Australia between 1972 and 1980 and the initiation of over 20 distance teaching institutions in Africa between 1960 and 1975 (Perraton, 1982b).

Daniel et al. (1982) refer not only to growth in numbers of institutions offering distance education but also to the growth and development of a body of knowledge regarding distance teaching principles and practices and an increase in scholarly communication. Growth in available literature regarding distance education as an indicator of growth in the overall field of distance education is also cited by Perraton (1982b).

U.S. distance education

In the United States, postsecondary distance education is more often a function of existing institutions than one of specially-created distance teaching entities. Evidences of growth in U.S. distance education emerge from a variety of sources. Early in the present decade and again mid-decade, the Corporation for Public Broadcasting surveyed around 3,000 American colleges and universities to identify their uses of television (Dirr & Katz, 1981) and of video, audio and computer technologies (Corporation for Public Broadcasting, 1986b) in academic programs. In 1978-79, 36% of the responding institutions indicated use of television to supplement existing coursework and 25% offered full courses via TV (Dirr & Katz, 1981). Six years later, 32% of the responding institutions were offering full television courses (Corporation for Public Broadcasting, 1986b). During the 1978-79 academic year alone, a total of 735 colleges offered a total of 6,884 courses over television, enrolling 498,000 students (Dirr & Katz, 1981). In 1984-85, 900 institutions offered more than 10,500 telecourses,

enrolling around 400,000 students (Corporation for Public Broadcasting, 1986b). These figures encompass both on- and off-campus use. A somewhat similar survey conducted by the Electronic Text Consortium in 1985 attempted to discern current levels of college and university utilization of electronic text (defined in the study as videotex, teletext, and all other forms of graphical information displayed on computer-based terminals) (Carey & Dozier, 1985). Three hundred postsecondary institutions were surveyed. Of the responding institutions, 62% did use some form of electronic text. Of that 62%, 85% were using it for instructional services, including 52% that had self-paced instructional systems in operation. These percentages span both on- and off-campus use. A more precise indicator of growth in postsecondary distance education for adults in the United States emerges from Lewis' (1983) study of 70 institutions utilizing telecommunications. Lewis cites the then-recent establishment of 10 statewide educational audio teleconferencing networks, the 1982 creation of the National University Teleconference Network, and the growth in telecourse utilization by various American institutions as evidence of ongoing expansion of distance education programming.

Postsecondary distance education spans a number of learning program categories (e.g., Daniel et al., 1982; Lewis, 1983) including (a) programs for professionals seeking to update their workplace skills (frequently referred to as professional continuing education), (b) various forms of noncredit learning, and (c) coursework bearing

academic credit and/or complete degree programs (frequently referred to as continuing higher education). The growth data cited above span all three of these categories. However, it is the final category that is the specific focus of this paper--that is, the intersection of distance education for older adults and postsecondary higher education: distance continuing higher education.

Growth in Distance Continuing Higher Education

Evidence in the literature of growth in the more specific areas of continuing higher education at a distance emerges from two sources: studies of the growth in the older student cohort interested in distance continuing higher education, and studies of growth in distance continuing higher education programming. Available statistics on the changing demographics of the U.S. population appear to support those who attribute growth in continuing higher education at a distance to an increasing adult student audience. America's large "baby boom" cohort (ages 35-44 years) numbered 23 million in 1970, rose to close to 26 million by 1980, and will top 36 million by 1990, according to the National Center for Educational Statistics (Frankel & Gerald, 1982). By 1990, they predict older students will constitute 47% of all college enrollments. That figure compares with only 28% in 1970. United States colleges and universities primarily use distance education programming to reach the same adult audience that is returning to the campus in greater and greater numbers to complete academic coursework for credit (e.g., Daniel et al., 1982; Frankel & Gerald, 1982; Lewis, 1983).

Therefore, this growth in the size of the adult learner population likely indicates continued growth in the demand for distance continuing higher education.

In addition to the growing cohort of potential adult postsecondary students, a stronger demand for education leading to formal degrees may exist among older adults than among young people, according to one distance education scholar. Waniewicz (1982) argues that an oversupply of postsecondary school graduates in recent years has left young people with ". . . a growing suspicion that the rate of return on the investment in a university degree is declining" (p. 87). Waniewicz contends that the situation with adults, however, is different: not only will the rising level of education of the population generate a greater demand for college degrees, but many adults will be encouraged to study further precisely because of the growth of distance education systems better meeting their continuing higher education needs.

Institutions offering distance education options have already begun to respond to the increased need for credit coursework on the part of adult students. The Corporation for Public Broadcasting survey mentioned earlier revealed that in addition to general widespread use of instructional television on the part of U.S. colleges and universities, the use of television for off-campus courses bearing academic credit was five times as common as its use for off-campus noncredit coursework (Dirr & Katz, 1981). The 1983 Lewis survey, also referred to previously, showed 56 of its 70 surveyed institutions as utilizing

telecommunications for credit-bearing postsecondary courses. Lewis also cites the 53,000 students enrolled in Public Broadcasting Service's first year of telecourse broadcasting, and the 3,000 students enrolled in credit coursework delivered through the Appalachian Community Service Network in 1981-82 as indicators of ongoing growth in distance continuing higher education.

Reasons for Growth in Distance Education

The growth of distance continuing higher education programs parallels both the growth of campus-based continuing higher education (i.e., the phenomenon of adult learners returning to college and university campuses for continued degree-program study) and the overall growth of postsecondary distance education in general. The increasing demand on the part of adults for accessible higher education has been attributed to numerous factors including not only the aging of the American "baby boom" cohort, but also the rapid expansion of the knowledge base, developments in the field of telecommunications over the past two decades, society's increasing emphasis on credentials, and even the changing role of women (Cross, 1981). Sewert (1982) summarized reasons for the growth of distance continuing higher education in this way:

> Because there are examples of the use of written material for educational purposes almost from the beginnings of written records, it is not teaching at a distance that is new but rather the growth and popularity of distance teaching institutions, particularly in the last decade. This growth has occurred pari passu [at an equal rate of pace] with the development of technologies and processes

> and its characteristics, releasing the student from the traditional confinement of time and space and admitting part-time study. These have proven attractive in an increasingly complex society, where change is rapid, where a need for updating knowledge and for continuing education is now generally accepted, and where, in any case, a more extensive education is becoming the sine qua non for the maintenance of a position in the society's work force (p. 27).

Lewis (1983), in his survey of 70 higher education institutions utilizing telecommunications, cites three primary reasons for colleges and universities having increased their involvement in continuing higher education at a distance: 1) changing demographic patterns--forcing many colleges to pursue alternative clientele and alternative instructional methods; 2) rising average ages of college students and increasing proportions of part-time working adult students--prompting educators to look for more flexible and convenient modes of delivering instruction to people with busy schedules; and 3) the combined effects of inflation, recession, energy crises, and severe budget restraints serving to motivate higher education institutions to explore more cost-effective ways of serving learners. Three years prior to Lewis' report, Munshi (1980) cited similar reasons for the increase in credit programming for distance learners. She refers to the aging of the U.S. population, growing numbers of part-time postsecondary students, and an intensified need for continuing education as the pace of change in American society increases. In addition, Munshi states that traditional patterns of college attendance ". . . are not always appropriate for adults in a society that provides information freely to its inhabitants

from many sources, but, at the same time, requires an increasing amount of certification for the acquisition of knowledge to be recognized" (p. 1).

In a volume titled The Cost of Distance Education, Perraton (1982a) looks at the growing demand for distance learning from an economic point of view. Perraton invites the reader to consider the total cost to society of distance education--or, to be more specific, the possible expense resulting from the lack of such provision for adult and continuing education. From an economist's point of view, says Perraton, the cost of distance teaching may be much less than the cost of social welfare programs or mass education ventures, for part of the cost efficiency of distance education lies in its ability to allow working adults to contribute economically to society through employment and the care of family members while continuing to study at their own convenience in their own location (Perraton, 1982a). From the economic point of view, it can be seen that the U.S. society's ongoing investments in child and youth education, while essential, have a forbiddingly long turn-around time; that is, given the rate of change and knowledge expansion in today's world, it may no longer be wise or profitable to rely solely on waiting for the next (superiorly-educated) generation to grow up and begin to tackle today's problems. Turn-around time on investments in education for adults is, on the other hand, much shorter. In order to succeed, the investment needs to take place as much as possible within the confines of adults' lives--i.e., be congruent with their

work lives, their family lives, and their geographical location. Distance education is a form of continuing higher education that meets those criteria (Stinehart, 1984).

Faculty Reactions to Participating in Distance Continuing Higher Education

The available literature on faculty involvement in distance teaching and related instructional technology innovation provides insights as to both negative and positive factors involved in distance teaching from the faculty point of view. In general, the literature leans toward a theme of faculty resistance to instructional telecommunications. For example, the Carnegie Commission on Higher Education's 1972 report on the use of instructional technology in higher education states:

> It has been our observation that some of the most impressive progress in instructional teachnology has been inspired by the initiative of individual faculty members who have grasped the potentials of new technologies and have applied them intelligently to their own teaching. On the other hand, faculty members themselves now rate resistance of faculty second only to lack of funds as the most severe obstacle to the adoption of new technologies (p. 68).

Lack of faculty support for the use of television in instruction was one of three major barriers identified by the 1981 Dirr and Katz study referenced earlier. (The other two barriers were lack of adequate institutional support and lack of available courses meeting the academic needs and standards of the institution.) The 1983 Lewis study, also referenced earlier, states that ". . . a pattern of faculty resistance to the use of telecommunications for instructional purposes" was

the problem most frequently cited by the 70 institutional coordinators surveyed (p. 50). Three levels of resistance were reported by Lewis: 1) "hardcore resisters" who resist change in any form; 2) those who resist technology for specific reasons such as "It's impersonal," "It entertains rather than informs," "It diverts resources that could be spent on salaries, libraries, etc.," and "It threatens my job;" and 3) those faculty who were not prejudiced against media, but who still felt uncomfortable with it because they were unfamiliar with the technology. At the other end of the continuum, however, Lewis reports that there are a few faculty members who have ". . . unbounded and uncritical enthusiasm for the potential of the technology to solve every imaginable educational problem" (p. 50).

A more current study has been conducted by Lewis on behalf of the Corporation for Public Broadcasting (1986a). Rather than survey faculty through a questionnaire, the Corporation for Public Broadcasting (CPB) study had Lewis sit down and talk with 173 faculty members from eight college campuses. Lewis found these faculty members ambivalent toward the use of instructional technology; intense criticism of what exists was mixed with guarded optimism about future possibilities. The most recurring theme was that of faculty feeling strongly that instructional technology should only be used as a supplement to their own instruction. At the same time, faculty were generally enthusiastic about video's ability to motivate and engage students and to expand the learning environment by bringing in things that could not be experienced in the classroom. They also thought computers had potential for

handling repetitive teaching tasks such as drill work and lab instruction, and could be helpful for managing course records. Science and math faculty felt computers were effective as tools for speeding up arithmetic calculations, thereby allowing students to concentrate on analytical thinking. On the negative side, concerns expressed included: fears that extensive use of instructional technologies would threaten faculty jobs; lack of institutional financial support for both hardware and software; lack of recognition for faculty participation in terms of promotion and tenure; incentives not being commensurate with the extra time required to develop and use instructional technology materials; lack of available equipment; lack of technical and logistical support; pre-produced programs being too superficial (video) or too resistant to adaptation (computer-assisted instruction); lack of training for faculty in the use of instructional technologies; and concern that instructional technologies contribute to passivity, poor reading and writing habits, and preference for predigested information on the part of students. Unfortunately for the purposes of this study, the Corporation for Public Broadcasting study does not distinguish between use of instructional technology in the classroom and use of telecommunications systems for distance teaching.

Gaff (1975), writing from a faculty development perspective, echoes the overall theme of faculty resistance to instructional technologies and adds to it the concept of "differential receptivity." Receptivity to instructional technology and innovation is likely to

vary by teaching discipline, according to Gaff. Medical and dental colleges and postsecondary institutions that see themselves as being in the business of "training" (as opposed to "educating") students have shown themselves to be more receptive to instructional innovation than traditional, humanities-oriented institutions. Therefore, it can be helpful to take into account the system within which the faculty member works in addition to focusing on individual instructors, according to Gaff. He writes that an organizational development approach which places emphasis on the interpersonal aspects of teaching and learning not only is worthwhile, but can actually compensate for some of the weaknesses of faculty development approaches that focus solely on the individual. Organizational development approaches are likely to utilize "top down" models to effect needed change, he adds. Gaff lists five elements faculty must possess in order to change their own teaching behaviors:

1. Information about alternative teaching-learning practices.
2. The belief that change is desirable.
3. The belief that they can change in the desired ways.
4. Opportunity to receive nonthreatening feedback about their own behavior.
5. Access to an institutional reward structure that recognizes and rewards their change efforts (p. 17).

Field, in a 1979 article on the role of faculty in telecourses, writes that many faculty ". . . look upon mass media courses as a threat to their jobs and to their professional standing" (p. 63). He

suggests faculty may be hesitant to participate in television courses because the role of the instructor is different for this type of teaching mode. According to Field, faculty members become less presentors of information and more "managers of instruction" with telecourses. They must be willing to work as a member of a team instead of autonomously, and must be willing to challenge such accepted procedures as the assumption that because one knows one's subject well, one can teach well. Field lists three competencies required of telecourse instructors: 1) knowledge of the subject; 2) understanding of and sympathy for the distance education system, including realization of that system's capabilities and limitations, and 3) experience in teaching. Field recommends administrators precisely define faculty members' roles in distance education and provide support for those roles, so that faculty can concentrate on the teaching.

The theme of providing adequate support for faculty involved with telecourses is echoed by Sachs (1983). His list of difficulties faced by faculty members teaching telecourses includes inadequate compensation; administrative hassles, such as difficulties in contacting students, frustrations with exam logistics, and problems with distance education courses running "off calendar;" lack of colleague support; and student criticism directed to the instructor regarding course video materials over which the instructor has had no control. Sachs' thesis is that instructors who initially are enthusiastic about teaching telecourses may, with experience, change their minds if support for their efforts is not provided by the institution offering the course. Kerr's

(1977) study of media specialists' roles offers insight into one angle regarding the provision of institutional support for distance teaching faculty. His results reveal that acceptance of the support provided by nonteaching professional staff for instructional innovation is highly correlated with perception of those staff members as able to see the problems of teaching from the instructor's point of view. Kerr labels this ability to identify with the teacher's perspective as "role taking ability."

One of the few studies providing hard data on faculty attitudes toward distance teaching is Harris' 1975 study of the motivations of British correspondence course teachers. Interest in correspondence education as a form of teaching was listed as a primary motivating factor by about one third of the tutors surveyed. Eighteen percent indicated correspondence teaching as their only currently-available option; they were trained teachers not currently able to teach in the traditional manner. Sixteen percent listed earning extra income as a primary motivator, while 10% indicated "helping disadvantaged individuals in their education and training" to be a strong motivator. Harris' subjects, incidentally, were part-time teachers, not full-time resident college or university faculty members. In an earlier study, also concerned with faculty attitudes toward correspondence teaching, Morishima, Schott and Micek (1968) interviewed 131 faculty members at colleges and universities in the state of Washington. They found faculty members very critical of the lack of professional recognition given for correspondence teaching and of the amount of remuneration

provided for correspondence instruction. The Washington state faculty also indicated they missed live contact with students in the classroom and felt many correspondence teaching tasks were menial and repetitious. On a more positive note, however, the faculty indicated teaching by correspondence resulted in improvements in their competence in communicating ideas, in keeping up-to-date, and in experimenting with different teaching techniques.

A 1984 Partin and Atkins study on teaching via electronic blackboard described faculty attitudes as ranging from ". . . those who accepted it as a challenge and responded with a great deal of innovation" to ". . . others who got by with a minimum of preparation" (p. 71). In general, Partin and Atkins found faculty feeling uncomfortable about not being able to see their students and obtain visual feedback to their teaching efforts. The instructors also became frustrated with the frequent equipment failure problems which plagued this particular project.

Benning (1985) surveyed 25 faculty members involved in audio teleconferencing and/or instructional television teaching for the geographically-dispersed population of the state of Alaska. The Alaskan faculty members identified six barriers to successful distance teaching:

1. Lack of visual contact in audio teleconferencing.
2. Need for high degrees of self-discipline, study skills, and self-confidence on the part of students learning at a distance.
3. Increased preparation and teaching time.

4. Increased need for logistical/administrative support for telephone calls, postage, envelopes, occasional travel to meet students, etc.
5. A need to increase the quality, depth, and applicability for rural audiences of materials produced outside Alaska.
6. Reduced ability to teach some concepts due to the limitations of distance and technology.

Benning also asked her faculty members to list benefits of distance teaching. They listed eight:

1. Accessibility of students to education greatly enhanced through access to rural students and the ability to study at home.
2. Individualized study significantly enhanced, enabling larger groups of students to fulfill their own individual learning goals.
3. Increased skill development in listening and verbalizing for the instructor.
4. Decreased sense of isolation for the faculty member.
5. Instructor able to provide a broader base of resources and expertise through audio and instructional television than through many classroom presentations.
6. Depending on circumstances, scheduling for both student and instructor may be easier and more flexible.
7. Instructors using audio conferencing can teach from virtually any location.

8. Reduced need to manage stresses of urban life such as parking on urban campuses.

Benning's Alaskan faculty members echoed some of the comments expressed four years earlier by Canadian faculty teaching satellite-delivered courses. (Potter, 1981). The Canadian instructors appreciated the ability of satellites to reach new, unserved audiences. They expressed concerns regarding the difficulty of judging students' responses when students cannot be seen, and their institutions' tendency to rate the design and development of satellite courses much lower than involvement in publications and research.

Benning's (1985) faculty were also asked to indicate recommendations they had for new faculty members planning to offer distance teaching courses. Their suggestions included carefully preparing for the course; getting to know students well and supporting students in their distance learning efforts; being accessible to students during nonclass hours; being flexible in one's approach and using the flexibility of the technologies to one's advantage; avoiding or limiting the use of traditional exams and lectures by substituting other types of teaching and learning activities; expecting the unexpected, such as equipment failure; insuring adequate office support and onsite support for students; visiting students in their home communities when possible; and consulting with other faculty to learn from their distance teaching experiences.

Lewis (1983) generated a list of six strategies for overcoming faculty resistance to telecommunications usage from the institutions he surveyed. They are:

1. Make provisions for active oversight and involvement by departmental faculty in all decisions that affect the academic quality of the distance education program.
2. Involve prominent faculty members in the distance education program from the very outset.
3. Involve as many full-time (rather than part-time) faculty in the program as possible.
4. Design the technology to be as uncomplicated and unobtrusive as possible.
5. Provide faculty with adequate orientation to the technology and to the entire delivery system.
6. Use the technology to serve remote learning sites, as faculty are likely to respond positively to time and money savings realized from no longer having to commute to off-campus sites.

Factors Influencing Faculty Participation in Distance Teaching

The literature on faculty attitudes towards distance teaching includes some statements from distance education program administrators and some from faculty members themselves. It spans part-time and full-time faculty and includes faculty engaged in a variety of distance teaching modes--television, correspondence study, satellite, audio

teleconferencing. Of those studies focusing most directly on distance teaching, the broadest-based is Lewis' (1983) survey on 70 U.S. post-secondary telecommunications program coordinators, and the most in-depth is Benning's (1985) survey of 25 Alaskan distance teaching faculty members. Emerging from this literature is a rather long list of negative factors regarding distance instruction and a shorter list of positive factors.

The negative factors fall quite naturally into three groups: initial factors that may be serving as barriers to faculty even trying out distance teaching; problematic factors arising from the actual experience of teaching at a distance that conceivably could discourage experienced faculty from continuing to engage in distance education; and an in-between category of negative factors that could apply to either distance teaching experienced or nonexperienced faculty. The initial group of factors focus primarily on issues related to resistance to change and/or to instructional technology. The middle set of factors relate to the incorporation of distance teaching into the traditional faculty role. The final set of factors center around logistics and the process of distance teaching. Negative factors in their groups are shown in Tables 2, 3 and 4.

Tables 5 and 6 contain the positive factors emerging from the current literature on faculty attitudes toward distance teaching. These factors represent experienced distance teaching faculty viewpoints only, the bulk of which emerge from Benning's (1985) in-depth study. It is difficult to tell from the available literature which positive factor

or factors could be responsible for a faculty member's initial foray into teaching at a distance, and which might only emerge with experience. Therefore, the positive factors have been grouped into two sets: those reflecting personal or operational issues and those reflecting more global or mission-related issues.

Table 2. Negative factors applicable to faculty not experienced in distance teaching

Factors
-- Lack of awareness of distance teaching opportunities.
-- General resistance to change.
-- General resistance to change in the role of the faculty member (i.e., concerns regarding technology as a threat to instructional control and/or to faculty jobs).
-- Resistance to the use of technology for instruction (e.g., technology is impersonal, technology entertains rather than informs, technology diverts resources from other needed areas, technology is inappropriate for nontechnical disciplines).
-- Concerns regarding one's unfamiliarity with the particular technologies involved.

Table 3. Negative factors that could be emanating from faculty either experienced or not experienced in distance teaching

Factors
-- Specific resistance to change in the role of the faculty member (e.g., moving from being "a dispenser of information: to being "a manager of learning," giving up autonomy to work as part of a distance education team).
-- Lack of professional recognition, colleague support and/or top-level institutional support for distance teaching.
-- Inadequate compensation for distance teaching.
-- Pre-produced course materials' inadequate content or applicability.
-- More specific concerns regarding the use of instructional technology for instruction (e.g., technology promotes learner passivity, technology fails to develop good reading and writing skills).

Table 4. Negative factors emanating from experienced distance teaching faculty

Factors
-- Equipment failure.
-- Problems with scheduling, logistics, and other administrative support arrangements.
-- Inability of professional support staff to identify with the teaching role.
-- Concerns with the increased planning and preparation time required for successful distance teaching.
-- Not being able to see students and receive visual feedback for teaching efforts.
-- Difficulties of teaching some concepts via technology.
-- Concerns about students needing particularly good study skills and self-discipline to successfuly handle distance learning modes of instruction.
-- Frustrations with receiving criticism for some pre-produced course materials over which one has had little or no control.

Table 5. Positive factors reflecting global or mission-oriented issues

Factors
-- Reaching out to students who otherwise would not be able to participate in postsecondary instruction.
-- Interest in a new challenge, in experimenting with different teaching techniques, and/or in distance teaching as a form of instruction.
-- The potentials of technology for solving educational problems.
-- Decreasing one's sense of isolation.
-- The ability of technology to provide a broader base of resources and expertise to students than many classroom methods can.
-- Enhancing students' individualized study.
-- Appropriateness of instructional technology for training students in technical disciplines.

Table 6. Positive factors reflecting personal or operational items

Factors
-- Receiving extra pay.
-- Improving own competence in listening and communicating skills.
-- Not having to commute to off-campus sites.
-- More flexible scheduling for both instructor and students (where applicable).
-- Opportunity to teach, where other options are not as available (part-time and distance teaching institution faculty).

Theoretical Basis for the Study

The theoretical basis for this study is drawn from Heinich's (1984) work in the area of infusion of instructional technology into educational institutions. Three assumptions underly Heinich's postulates. The first is that distance teaching is a subset of the field of instructional technology. The second is that there is no question but that instructional technologies can effect quality learning. This has been demonstrated numerous times by studies favorably comparing learning outcomes of students receiving instruction via media/telecommunications modes to those of students receiving traditional classroom instruction. Heinich's third assumption is that the most potent barrier to further development and use of instructional technologies at this time is instructor (and by extension, institutional) unwillingness to fully utilize available technologies.

Heinich presents a number of definitions of technology, the most succinct of which is the Webster's New Collegiate Dictionary definition: "a technical method of achieving a practical purpose." Instructional technology is technology put to use for teaching and learning purposes. By way of further definition, Heinich lists five characteristics and principles that apply to both instructional technology and technology in general:

a) replicability (doing things in a reproducible manner);

b) reliability (able to consistently do what the technology purports to do);

c) algorithmic decision making (that which is based on "decision rules" for determining alternative courses of action depending upon the circumstances; in an instructional sense, this includes such formats as programmed instruction and computer-assisted instruction);

d) communication and control (with technology these can be done anywhere, with anyone); and

e) effect of scale (ever-improving technology causes changes in scale which then causes changes in institutional format).

Heinich's theory contains two basic statements. His first is that instructors resist the use of instructional technology because it disturbs the "power relationships" inherent in the traditional teaching role. In formal education, the assignment of instructional authority to faculty is taken for granted. For most traditional instruction, faculty have significant control over curriculum (the content of what is to be learned/taught) as well as over instruction (the implementation of the curriculm, or the process of teaching). Whereas curriculum and instruction traditionally have been viewed by faculty as separate processes, instructional technologies often cause them to be combined. With recorded video instruction, for example, the relationships between the curriculum and the instruction of that curriculum must be planned out and developed in advance. This reduces the faculty member's total control over day-to-day instruction, disturbs the traditional relationship between curriculum and instruction, and involves nonteaching professionals in the instructional planning process. In addition,

instructional technologies can actually effectively and efficiently replace much of what teachers currently do. Since faculty, however, generally prefer the power relationships the way they are, they resist use of educational technology and reduce those technologies they do use to the status of "tools." No counterpoint authority to institutionalized instruction technology exists in most organizations. The result is severe underutilization of instructional technology in educational institutions. Heinich does not see technology as a replacement for teachers. He does, however, see it as greatly affecting the currently-perceived role of the teacher. A key question Heinich says will eventually need to be answered is: "Under what circumstances of societal need do we rely upon the labor-intensive, emotionally-satisfying teaching as craft ('traditional' teaching), and when should we rely on the efficiency of instructional technology systems" (p. 78)? In short, Heinich states that the education professional most directly affected by instructional technology is the teacher, and that understanding the effects of instructional technology on faculty control over the teaching-learning process--i.e., instructional "power relationships"--is essential to overcoming status quo usage.

Heinich's second major statement is that the root of instructional technology is technology itself--not the field of education. Instructional technology adoption would benefit from being freed from its concentration on specific technological instruments of instruction and focusing instead on problem-solving regarding the infrastructures that support the basic assumption of instructional authority. The approach

to date, as described by Heinich, has been to conduct research on the teaching-learning effectiveness of specific instructional technologies in the hopes of attracting faculty by demonstrating how well the particular technology effects student learning. This approach has not been very successful. Instead, Heinich calls for looking at complex systems problems regarding the adoption of technology as applied to educational institutions. The clients of such research will not be faculty members themselves as much as administrators, school boards, trustees, legislators, and others charged with bottom-line responsibilities for educational accountability. Heinich theorizes that a technology--any technology--"survives because of faith, continuing internal improvement, an institutional structure that encourages and faciliates continued development, and an environment that permits [it] to seek the best avenues for its contribution" (p. 82). Research data on effecting that type of environment within the setting of educational institutions is needed in order to achieve full utilization of available instructional technologies, Heinich concludes.

Discussion

Research to date has generated descriptive data on faculty attitudes towards distance teaching. However, no study has been made of the relative influence of the various factors involved. Tables 2 through 6 in this chapter classify the factors emerging from the literature according to source (as emanating either from experienced or from nonexperienced distance teachers), according to whether they are

positive or negative, and according to whether they represent personal or more global issues. Heinich's theory can also be used to organize the research to date. Supportiveness of the overall institutional environment and instructor concerns with losing control over the teaching-learning process when teaching via technology are the two critical factors affecting technology adoption, according to Heinich. The available literature on distance teaching speaks to various aspects of each of these theses.

Institutional support

The extent to which the institution and the instructor's peer group support--or fail to support--participation in distance teaching is discussed by Gaff (1975), Harris (1975), Dirr and Katz (1981), Potter (1981), and the Corporation for Public Broadcasting (1986a). Institutional support in terms of instructor pay for distance teaching appears in Harris (1975) and the Corporation for Public Broadcasting report of January, 1986. In addition, institutional support as reflected through the essential provision of staff services for distance teaching is discussed by Gaff (1975), Field (1979), Sachs (1983), Benning (1985), and the Corporation for Public Broadcasting (1986a). These references speak to the need for adequate administrative, collegial and staff support to attract and retain distance teaching faculty. They stop short, however, of stating, as Heinich does, that institutional support is a more potent influence on faculty attitudes towards distance teaching than are other factors. Neither Heinich nor the distance teaching references attempt to actually measure the relative

influence of institutional support as compared to other identified factors, on faculty attitudes towards distance teaching.

Control over the teaching-learning process

Heinich's other major statement--that instructors resist teaching via technology because doing so represents lessened control over the teaching-learning process--is also supported by the literature. Lewis (1983) speaks to the existence of some faculty resistance to change in any form, and Field (1979) discusses the necessity for faculty members to give up some autonomy to work as part of a distance teaching team. Faculty resistance to teaching technologies being used as anything more than a supplement to their own instruction (Corporation for Public Broadcasting, 1986a), concerns regarding pre-produced distance teaching materials' resistance to adaptation (Corporation for Public Broadcasting, 1986a), and concerns with not being able to see students to obtain visual reactions while teaching (Potter, 1981; Partin & Atkins, 1984; Benning, 1985) are other documented aspects of this phenomenon. In addition, Field's (1979) description of the change in the distance teaching faculty role from being one of a "dispenser of information" to being one of a "manager of learning" reflects the issue of faculty perceiving teaching technologies as equaling a loss of control over the teaching-learning process and choice of subject matter. Likewise, Gaff's (1975) opinion that using instructional technologies means it is necessary for faculty members to feel they can and should change and to receive nonthreatening feedback about their changing, and concerns

expressed in the literature that distance teaching is, ultimately a threat to faculty jobs (Field, 1979; Lewis, 1983; Corporation for Public Broadcasting, 1986a) speak to this same issue. As Heinich puts it, instructional technology forces the faculty member to share instructional control with nonteaching professionals and with the demands and characteristics of a particular technology--a "power-sharing" arrangement that most faculty instinctively resist. The above-cited references document faculty members' concerns with change in their teaching roles; they stop short, however, of echoing Heinich's thesis that these changes are the other key factor in faculty resistance to instructional technology. Further, neither Heinich nor the distance teaching literature to date attempts to actually measure the relative influence of this or any other identified factor on faculty members' attitudes towards distance teaching.

Use of technology for instruction

Two categories of factors emerging from the literature are dismissed by Heinich as no longer being central to the issue of adoption of instructional technology. The first of these could appropriately be labeled "the use of technology for instruction" and would encompass the following literature references: concerns with whether technology informs or merely entertains (Lewis, 1983); the instructor's degree of familiarity with distance teaching technologies (Lewis, 1983); the appropriateness of distance teaching for particular subject matter (Gaff, 1975; Benning, 1985); concerns with distance instruction diverting

resources that could be used for other purposes (Lewis, 1983); concerns regarding the "impersonalness" of technology (Lewis, 1983); the potential for teaching technology to solve some heretofore unsolvable educational problems (Harris, 1975; Potter, 1981; Lewis, 1983; Benning, 1985); and the ability of telecommunications technologies to decrease the sense of isolation between instructors and students (Benning, 1985). Heinich says there is no longer any question but that teaching technologies can effect quality learning and make possible many effective learning situations not now possible. He states that while this has been demonstrated many times over to the instructors, it has failed to effect widespread adoption of instructional technology.

Quality issues

The other category emerging from the reviewed literature that Heinich basically dismisses is that of quality issues in distance teaching. This category encompasses these specific references: adequacy of pre-produced telecourse materials for university instruction (Corporation for Public Broadcasting, 1986a); concerns that distance instruction promotes learner passivity and/or requires better study skills on the part of students (Benning, 1985; Corporation for Public Broadcasting, 1986a); comparisons with campus-based traditional coursework in terms of course quality (Dirr & Katz, 1981; Benning, 1985); and the positive factors of distance teaching technologies providing additional resources for students that the classroom often cannot provide (Benning, 1985; Corporation for Public Broadcasting, 1986a), and

the instructors improving their own listening and communications skills through teaching at a distance (Morishima et al., 1968; Benning, 1985). Again, Heinich says these issues are already resolved "in favor of" instructional technology. Still, knowing that fails to attract large numbers of faculty and institutions to use of available technology. Again, neither the distance teaching literature nor Heinich have attempted to actually measure any relative influence of these or any other factors on faculty participation in distance instruction.

Awareness of, and logistics involved in, distance teaching

It is necessary to move beyond Heinich's theory and its classification of the reviewed distance teaching literature to encompass all of the categories of factors emerging from that literature. Specifically, two categories emerging from the literature are not referred to by Heinich in any way. These are: awareness of distance teaching opportunities as a precursor to involvement in it (Gaff, 1975; Lewis, 1983), and a set of factors that could be grouped under the heading "logistics." The logistics category would include: concerns regarding equipment failure (Partin & Atkins, 1984; Corporation for Public Broadcasting, 1986a); problems with scheduling and exam arrangements (Sachs, 1983; Benning, 1985); the time involved in planning and preparing for distance teaching (Benning, 1985; and Corporation for Public Broadcasting, 1986a); the positive aspect of not having to commute to off-campus sites (Benning, 1985); and the advantages gained with flexibility of scheduling one-on-one communications with students (Benning, 1985).

Conclusion

Grouping research findings under descriptive categories using Heinich's theory as a framework, yields the following overall literature classification scheme:

1) Awareness of distance teaching opportunities
2) Logistics
3) Quality issues
4) Use of technology for instruction
5) Institutional support:
    a) Administrative and collegial
    b) Staff services
6) Instructor control over the teaching-learning process

Heinich's theory provides some untested explanations for faculty participation in distance teaching by postulating that categories 5 and 6 above constitute the determining factors affecting faculty attitudes, while categories 3 and 4 above are not at issue. Heinich does not speak to categories 1 and 2 above, although the literature on distance teaching does. Neither Heinich nor the distance teaching literature attempt to measure the relative influence of the six categories of factors that emerge. Hence, outside of some descriptive data and speculation, it is not known which, if any, of the factors identified to date bear the most influence on a faculty member's decision to participate or not to participate in distance teaching. Specifically, two unanswered questions are the foci of this study: Do faculty primarily resist distance

teaching because the process of teaching via instructional technology is perceived as lessening instructor control over the teaching-learning process? and, Does institutional support constitute the strongest catalyst for attracting and sustaining distance teaching activity?

CHAPTER III. METHODOLOGY

It is evident from the literature that descriptive data on faculty attitudes towards distance teaching--both positive and negative--are available from a variety of sources. This study asks the question: Which of the identified factors carry the most weight in influencing faculty participation in distance teaching? The theoretical base for this study (Heinich, 1984) recommends taking an organizationwide perspective in answering the question. It also suggests a focus on the education professional most directly affected by developments in distance education: the instructor. Two specific research sub-questions, therefore, guide this study:

Research Question #1: Do faculty primarily resist distance teaching because the process of teaching via instructional technology is seen as lessening instructor control over the teaching-learning process?

Research Question #2: Does institutional support constitute the strongest catalyst for participation in distance teaching?

Design of the Study

Survey research was selected as the appropriate data collection design for this study. An original questionnaire developed by the researcher gathered responses from Iowa State University faculty members during the fall semester of 1986. Factors influencing faculty

participation in distance teaching as revealed by the review of literature provided the basis for the 52-item instrument. Forty-seven attitudinal items constituted the independent variables. These statements covered six categories: awareness of distance teaching opportunities, logistics concerns, quality issues, the use of technology for instruction, institutional support (both in terms of administrative support and staff services), and issues relating to faculty control over the teaching-learning process. The two dependent variables were experience in distance teaching and willingness to instruct a distance education course within the next two years. Four descriptive items--sex, tenure status, length of employment at Iowa State University, and overload pay status--were also included in the instrument. In addition, information as to professorial rank, salary, and teaching area/discipline were obtained for each respondent from other sources.

Hypotheses were developed to ascertain which of the identified attitudinal factors carried the most weight in influencing faculty participation in distance teaching. In general, it was hypothesized that factors relating to a lessening of instructor control over the teaching-learning process would constitute the most negative influence, while factors relating to institutional support of distance teaching would constitute the most positive influence.

The survey instrument was mailed to subjects for completion, and completed instruments were also returned by mail. Inferential statistics and descriptive analyses were used to analyze the data collected.

For parts of the analysis, responses were divided into four groups: (1) faculty experienced in distance teaching who are willing to continue with distance instruction; (2) faculty experienced in distance teaching but not willing to continue with it; (3) faculty not experienced in distance teaching but willing to try it; and (4) faculty not experienced in distance teaching and not willing to try it.

Population

Teaching faculty at Iowa State University employed during the 1986-87 academic year served as the population for the study. Included in the population are faculty from the following academic colleges: Agriculture, Business Administration, Design, Education, Engineering, Home Economics, Sciences and Humanities, and Veterinary Medicine. Excluded from the population are faculty whose primary appointments are in research, administration, or Cooperative Extension field work.

The population was initially divided into two groups. Group A was composed of teaching faculty who have participated in distance instruction within the past five years. Group B was composed of all other teaching faculty. Group A's distance teaching experience spans four instructional telecommunications modes:

1. Telecourses. These courses make use of nationally-produced video programs that are broadcast over Iowa Public Television. In addition to the television segments accompanying texts, study guide, course syllabus, and student assignments make up the course. Usually, the text(s) and study guide

accompanying the video segments are also pre-produced and come as part of the telecourse "package." The course syllabi, exam questions, and written assignments, on the other hand, are generally Iowa State University (ISU) instructor-produced. Exams are proctored at local extension offices around the state; written assignments are mailed in to the instructor. An optional on-campus meeting for the instructor and all enrolled students statewide is held around midterm. Telecourses are a home-study type of distance education. Iowa State has been offering three to six telecourses per semester since 1976, primarily through the colleges of Business Administration, Home Economics, and Sciences and Humanities.

2. Audio Teleconferenced Courses. These courses are taught live via conference telephone hook-up. Two-way live audio interaction is present through microphones and speakers; video is not a part of the format. Generally, three to eight remote sites are involved, with instructors teaching some sessions from campus and traveling to the sites to originate others. Occasionally, an on-campus class is included as one of the course's sites. Textbooks, assignments, handouts, exams, and class discussions are integral components of the courses. Both the Regents Telebridge System (a two-wire bridged network) and the Iowa Community College TeleNetwork (a four-wire dedicated line system) are

used for the delivery of ISU audio teleconferenced courses. Iowa State has been offering one to four audio teleconferenced courses per semester since 1982, primarily through the colleges of Education, Home Economics, and Sciences and Humanities.

3. Videotaped Courses. For videotaped courses, an existing on-campus class is scheduled into a studio classroom and its sessions are captured on videotape as they take place. Virtually no editing of tapes is done; hence, ISU videotaped courses are a "candid classroom" type of video instruction. Videocassettes are mailed to participating sites the day after each class session is taped to be viewed by distance students. Videotaped courses are generally scheduled through corporate employers who use their own plant sites for groups of engineers to view the tapes during the regular work day. Textbooks, exams, mail-in written assignments, and two or three instructor visits to the corporate site throughout the semester comprise the other course components. Eight to ten videotaped courses have been offered each semester from ISU since 1968, almost all of them through the College of Engineering.

4. Satellite Videoconferenced Courses. These courses are taught live in a one-way video, two-way audio format. Full-motion broadcasts of class instruction are delivered via satellite uplink; "talk-back" phone connections allow the students to

ask questions of the instructor. Textbooks, mail-in assignments and exams are also utilized. Two courses involving several team-teaching instructors had been delivered by satellite at the time this questionnaire was sent out--one in computer science and one in agriculture.

Sample selection

The entire population of Group A served as its sample, as there were 69 faculty members with recent experience in teaching students at a distance from ISU campus.

A systematic random sample of 70 faculty members was selected from population Group B using a "skip" number. The skip number was calculated by subtracting 69 (the size of Group A) from the total number of teaching faculty employed at Iowa State, and then dividing the result by 69. The initial faculty member name was then selected through use of a random number table, with remaining names selected by "skipping" the distance of the skip number from the first name for the sample to the second name, from the second name to the third name for the sample, and so on.

Characteristics of the sample

Of the 139 questionnaires mailed out, 105 resulted in usable returns. Of the 105 respondents, 53 have taught off-campus through telecommunications modes, and 52 have not. Approximately three-fourths of the sample are men and one-fourth are women, as shown in Table 7 below. Tables 8 through 11 show additional demographic characteristics of the sample:

professorial rank, tenure status, years at Iowa State University, and salary. In general, the two groups--experienced in distance teaching and not experienced in distance teaching--are similar on these demographic traits.

Table 7. Sample distribution by gender

	Group A (Experienced)	Group B (Inexperienced)	Total
Female	12 (22.6%)	14 (26.9%)	26 (24.8%)
Male	41 (71.4%)	38 (73.1%)	79 (75.2%)
Totals	53 (100.0%)	52 (100.0%)	105 (100.0%)

Table 8. Sample distribution by professorial rank

	Group A (Experienced)	Group B (Inexperienced)	Total
Professor	19 (35.8%)	21 (40.4%)	40 (38.1%)
Associate Professor	15 (28.3%)	9 (17.3%)	24 (22.9%)
Assistant Professor	8 (15.1%)	10 (19.2%)	18 (17.1%)
Instructor, Adjunct, Temporary	7 (13.3%)	10 (19.2%)	17 (16.2%)
Rank not listed	4 (7.5%)	2 (3.8%)	6 (5.7%)
Totals	53 (100.0%)	52 (100.0%)	105 (100.0%)

Table 9. Sample distribution by tenure status

	Group A (Experienced)	Group B (Inexperienced)	Total
Have tenure	40 (75.5%)	35 (67.3%)	75 (71.4%)
Do not have tenure	13 (24.5%)	16 (30.8%)	29 (27.6%)
Did not indicate		1 (1.9%)	1 (1.0%)
Totals	53 (100.0%)	52 (100.0%)	105 (100.0%)

Table 10. Sample distribution by years employed at Iowa State University

	Group A (Experienced)	Group B (Inexperienced)	Total
1-10	22 (41.5%)	24 (46.2%)	46 (43.8%)
11-20	14 (26.4%)	16 (30.8%)	30 (28.6%)
21+	17 (32.1%)	11 (21.2%)	29 (27.6%)
Did not indicate		1 (1.9%)	1 (1.0%)
Totals	53 (100.0%)	52 (100.0%)	105 (100.0%)

Table 11. Sample distribution by annual salary

	Group A (Experienced)	Group B (Inexperienced)	Total
$19,000-$29,999	10 (18.9%)	6 (11.5%)	16 (15.2%)
$30,000-$39,999	15 (28.3%)	11 (21.1%)	26 (24.8%)
$40,000-$49,999	12 (22.6%)	11 (21.1)	23 (21.9%)
$50,000+	10 (18.9%)	11 (21.1%)	21 (20.0%)
Salary not listed	6 (11.3%)	13 (25.0%)	19 (18.1%)
Totals	53 (100.0%)	52 (100.0%)	105 (100.0%)

Table 12 shows the breakdown by teaching discipline of the two sample groups and the total sample. Engineering and education faculty would appear to be slightly overrepresented in Group A as compared to the random Group B sample, and math/science and veterinary medicine faculty appear to be slightly underrepresented in Group A.

Table 13 refers to distance-teaching-experienced faculty only. It shows telecommunications teaching mode used and whether or not those faculty members received overload pay for their involvement in distance instruction. More faculty have taught via videotape or through pre-produced telecourses than have experienced audio teleconferencing or

satellite instruction. More than half have received extra pay for their distance teaching involvement.

Table 12. Sample distribution by teaching discipline

	Group A (Experienced)	Group B (Inexperienced)	Total
Agriculture	4	4	8
Business	3	3	6
Computer Science/Engineering	18	11	29
Education	10	4	14
Home Economics	3	2	5
Humanities/Fine Arts	12	17	29
Math/Science	1	4	5
Veterinary Medicine		6	6
Data not available	1	2	3
Totals	52 (100.0%)	53 (100.0%)	105 (100.0%)

Table 13. Group A distribution by teaching mode and overload pay status

Teaching Mode		Overload Pay Status	
Videotape	17 (32.1%)	Received overload	33 (62.3%)
Satellite	9 (17.0%)	Did not receive overload	19 (35.8%)
Audioteleconferencing	9 (17.0%)	Did not indicate	1 (1.9%)
Telecourse	17 (32.1%)		
Unknown	1 (1.9%)		
Totals	53 (100.0%)		53 (100.0%)

Instrumentation

The survey data-gathering instrument (Appendix B) used in this study was an original one, developed by the researcher from those factors affecting faculty attitudes towards distance teaching as revealed by the literature. Forty-seven attitudinal items constituted the independent variables for the study and covered six categories of distance teaching issues. These were: awareness of distance teaching opportunities (3 items, question #1), logistics concerns (5 items, 3 in question #2 and statements 1 and 6 in question #3), quality issues (7 items, numbers 2, 3, 4, 5, 7, 8, and 9 in question #3), the use of technology for instruction (8 items, question #4), administrative institutional support (10 items, all those in question #5 plus the last item in question #6), faculty control over the teaching-learning process (8 items, all but the last statement in question #6), and institutional support in terms of staff services (6 items, question #7). Items were grouped according to type of response sought, and, as much as possible, according to category.

A response scale of 1 to 5 was used throughout the questionnaire. Sixteen items were phrased so that a "5" was the most positive possible response. These included all three items in question #1, the first two items in question #2, statements 1, 4, 6, and 8 in question #3, and statements 1, 2, 3, 4, 5, 6, and 8 in question #6.

Thirty-two of the items were phrased so that a "1" response was the most positive response possible. These items were the last statement in question #2, statements 2, 3, 5, 7, and 9 in question #3,

statements 7 and 9 in question #6, all the items in questions #4, #5, #7, and question #8. Reverse scores for those statements where a "1" was the most positive possible responses were used in tabulating responses to the statements. In this way, higher scores indicated more positive attitudes towards distance teaching and lower scores indicated more negative viewpoints. Sums and means for each item and each category of attitudinal factors were then calculated. Table 14 below explains the interpretation of scores.

Table 14. Interpretation of survey instrument sums and means according to category

Category	The higher the sum or mean . . .
Awareness	. . . the more the faculty member is aware of the field of distance teaching.
Logistics	. . . the less the faculty member feels logistics (scheduling, equipment, etc.) present problems for distance instructors.
Quality	. . . the more the faculty member feels distance teaching and learning are of comparable quality to on-campus instruction and learning.
Control Over the Teaching-Learning Process	. . . the less the faculty members feel distance teaching reduces their control over the teaching-learning process.
Administrative Support	. . . the more the faculty member feels administrators and colleagues encourage and reward participation in distance teaching.
Staff Services	. . . the more positive the faculty member regards the distance teaching support services available at Iowa State University.

Measurement of the dependent variable of experience in distance teaching was obtained through selection of the population, as previously described. Faculty members' names obtained through the Office of Continuing Education were designated as experienced in distance teaching (Group A), while faculty names obtained through the systematic random sampling procedure (Group B) were designated as inexperienced in distance teaching. Measurement of the dependent variable of willingness to engage in distance teaching was obtained through the instrument by asking respondents to indicate their degree of interest in instructing a distance teaching course within the next two years. A comparable "1 through 5" scale was used for this question with "1" being the most positive response possible. Faculty were also asked to indicate on the instrument the number of years they have been employed at Iowa State University, their tenure status, and whether or not they had received overload pay for teaching at a distance (experienced faculty only). This information was used in analyzing faculty perceptions of institutional support for distance teaching. In addition, a number of demograhpic variables were used. For example, respondents were asked to indicate gender on the survey instrument. In addition, information on salary (Iowa State University, 1986a), professorial rank and teaching department (Iowa State University, 1986b) were gathered from other sources. Respondents were also invited to add written comments at the end of the questionnaire.

Validity

Three approaches were used to establish the validity of the data-gathering instrument. First, the instrument was designed with an emphasis on construct validity. Each of the items on the instrument was drawn from descriptive data in the distance teaching literature to date. Further, the instrument was constructed to put into operation the theoretical basis underlying the study. Questions #5, #6 and #7 speak specifically to Heinich's (1984) propositions; in addition, the analysis of the data the instrument would yield was designed from the theoretical basis.

Secondly, the instrument was piloted on four faculty members--two experienced in distance teaching and two who were not experienced in it--to insure all questions made sense to potential respondents. Pilot faculty represented the colleges of Engineering, Business Administration, Education, and Sciences/Humanities. Phrasing was adapted for a couple of questions based on the results of the pilot test.

In addition, Pearson correlation coefficients were calculated for each question against the mean of the item's overall category. A correlation coefficient of .50 or above was considered sufficient to establish an item's validity. The Pearson coefficients for each item are shown in Table 15. As a result of the validity (and reliability) analyses, items 2.3, 3.4, 3.5, 3.6, 5.5, 5.9, and 6.9 were removed from portions of the data analysis using stepwise multiple regression by category.

Table 15. Pearson correlation coefficients for items in the data-gathering instrument

Category	Item Number	Correlation Coefficient
Awareness	1.1	.936
	1.2	.882
	1.3	.912
Logistics	2.1	.599
	2.2	.592
	2.3	.275[a]
	3.1	.539
	3.6	.498[a]
Quality	3.2	.616
	3.3	.694
	3.4	.424[a]
	3.5	.414[a]
	3.7	.545
	3.8	.630
	3.9	.512
Use of Technology for Instruction	4.1	.612
	4.2	.701
	4.3	.628
	4.4	.693
	4.5	.719
	4.6	.762
	4.7	.726
	4.8	.654
Institutional Support--Administrative	5.1	.747
	5.2	.767
	5.3	.751
	5.4	.697
	5.5	.424[a]
	5.6	.720
	5.7	.577
	5.8	.592
	5.9	.491[a]
	6.9	.366[a]

[a]Deleted from regression equations using categories.

Table 15. Continued

Category	Item Number	Correlation Coefficient
Control Over the Teaching-Learning Process	6.1	.619
	6.2	.731
	6.3	.696
	6.4	.627
	6.5	.770
	6.6	.655
	6.7	.694
	6.8	.541
Institutional Support--Staff Services	7.1	.854
	7.2	.844
	7.3	.833
	7.4	.771
	7.5	.771
	7.6	.919

Reliability

The data-gathering instrument was also analyzed for reliability using the Cronbach alpha coefficient, which provides a generalizable estimate of the internal consistency or homogeneity of the instrument by assessing the degree to which the items function in a homogenous fashion. An alpha coefficient of .60 was considered acceptable.

Four of the categories yielded Cronbach alpha's well above the required .60 minimum. They were: Awareness (alpha = .896), the Use of Technology for Instruction (alpha = .831), Control Over the Teaching-Learning Process (alpha = .817), and both halves of the Institutional Support category (staff support alpha - .932 and administrative support alpha = .832). Two categories yielded initially low alphas: Logistics

(alpha = .231) and Quality (alpha = .602). Items 3.4 and 3.5 were removed from the Quality category, raising the Cronbach alpha to .643 for that set of questions. Items 2.3 and 3.6 were removed from the Logistics category; however, the resultant alpha of .433, although improved, still lies below the preferred .60 minumum. Therefore, it is important to bear in mind that the potential low reliability of items in the Logistics set when perusing those results that make use of that category.

Data Collection

The instrument (Appendix B) was distributed to 139 faculty members in December of 1986, along with a cover letter explaining the research study (Appendix A). Questionnaires were coded prior to mailing for purposes of follow-up on nonrespondents. Eighty-six responses, representing 62% of the total, were received from the initial mailing. Eighty-one of the responses resulted in usable completed questionnaires. Nonrespondents received a second copy of the survey and a reminder cover letter in mid-January after the winter semester break. One week later, reminder phone calls were placed to the remaining subjects who had yet to respond. The follow-up activities resulted in 28 additional responses, of which 24 were usable questionnaires, for a total usable response rate of 76%.

Data Analysis

Data collected from the instrument were coded and the information key-punched for statistical analysis. The Statistical Package for the

Social Sciences (SPSSx) was used to analyze the data. Stepwise multiple regression and independent t-tests were the statistical tests used with the data. Cross-tabulations and frequencies were also calculated, and all comments written on the questionnaires were collected and scanned.

Hypotheses and Accompanying Analyses

Five hypotheses were tested to ascertain which of the literature-identified attitudinal factors carry the most weight in influencing faculty participation in distance teaching. The first research question for this study draws upon the fact that a number of studies in the literature refer to faculty resistance to change in traditional teaching roles (e.g., Gaff, 1977; Field, 1979; Sachs, 1983; Benning, 1985). More specifically, Heinich (1984) postulates that instructors resist the use of instructional technologies because the process of teaching via instructional technology lessens the instructor's control over the teaching-learning process. Three hypotheses emanate from the first research question:

H1 There is significant ($p < .05$), positive predictive relationship between willingness to engage in distance teaching and perceptions regarding control over the teaching-learning process in distance teaching.

H2 After those factors relating to control of the teaching-learning process are accounted for, no other factor categories will have a significant ($p < .05$), predictive relationship to willingness to engage in distance teaching.

H3 Faculty not experienced in distance teaching who indicate reluctance to initiate participation in it will rate those factors relating to control of the teaching-learning process significantly ($p < .05$) less positively than will faculty willing to participate in distance teaching.

Hypotheses 1 and 2 were tested by applying a stepwise multiple regression technique to ascertain the predictive relationship between faculty members' willingness to engage in distance teaching, and their perception of distance instruction's effect on faculty control over the teaching-learning process. Secondly, the regression equation compared the strength of the control over the teaching-learning process variable to the strength of the other independent variables on willingness to engage in distance teaching.

Hypothesis 3 was tested using the t-test for independent samples to analyze mean differences between inexperienced and unwilling distance teaching faculty, and all faculty willing to engage in distance teaching on the category of control over the teaching-learning process.

The second research question in this study relates to positive factors that may boost participation in distance teaching and is based on a systems-wide perspective (e.g., Gaff, 1977; Kerr, 1977, Heinich, 1984). Two hypotheses emanate from this research question:

H4 Faculty indicating willingness to initiate or continue with participation in distance teaching will rate those factors relating to institutional administrative support significantly ($p < .05$) more positively than will faculty indicating reluctance to initiate or continue with distance teaching.

H5 Faculty experienced in distance teaching who indicate willingness to continue participation in distance teaching will rate those factors relating to institutional staff services significantly ($p < .05$) more positively than will experienced faculty who indicate unwillingness to continue in distance teaching.

Hypotheses 4 and 5 were tested through independent t-tests. Mean differences on institutional administrative support factors between faculty willing to participate in distance teaching (regardless of past distance teaching experience) and faculty unwilling to participate were compared for Hypothesis 4. The Hypothesis 5 t-test compared means between experienced faculty who were interested in continuing to teach at a distance, and experienced faculty who were not, on those factors related to staff support services. The results of the data analyses are described in the next chapter.

CHAPTER IV. RESULTS OF THE STUDY

Introduction

This study asks the question: Which of the factors identified from the literature carry the most weight in influencing faculty participation in distance teaching? One hundred five faculty at Iowa State University (ISU) responded to a survey questionnaire designed to obtain their assessment of factors involved in distance teaching. Specifically, the faculty members were asked to rate the importance of distance-teaching-related factors in six categories: awareness of distance instruction opportunities, concerns regarding the logistics of distance teaching, issues related to the quality of distance learning, institutional support for distance instruction (both in terms of administrative support and staff services), and whether distance teaching reduces instructor control over the teaching-learning process. The ratings were tabulated so that higher scores indicated more positive attitudes towards distance teaching and lower scores indicated more negative viewpoints.

The results of the faculty members' ratings were statistically compared to their indication of their own willingness to begin or continue with distance teaching. It was hypothesized that the faculty would rate those factors relating to a lessening of instructor control over the teaching-learning process as the most negative influence

(Hypotheses 1, 2 and 3), and those factors relating to institutional support of distance teaching as the most positive influence (Hypotheses 4 and 5) on their willingness to teach at a distance. Stepwise regression, independent t-test, cross-tabulations, and frequencies were the statistical processes used to analyze the data in relation to the hypotheses.

Hypotheses 1 and 2

Hypotheses 1 and 2 predict a relationship between willingness to engage in distance teaching and perceptions regarding control over the distance teaching-learning process. The alpha level was set at .05. The two hypotheses read as follows:

H1 There is a significant, positive predictive relationship between willingness to engage in distance teaching and perceptions regarding control over the teaching-learning process in distance teaching.

H2 After those factors relating to control of the teaching-learning process are accounted for, no other factor categories will have a significant, predictive relationship to willingness to engage in distance teaching.

Stepwise multiple regression was used to test both hypotheses. Willingness to participate in distance teaching as measured by item 8 on the questionnaire served as the dependent variable. Sums of the responses to five of the six categories of factors (awareness, quality, use of technology for instruction, control over the teaching-learning process, and institutional support) served as the independent variables. The logistics category was not used in the regression equation due to its low reliability (as shown in Chapter III and discussed further at

the end of this section). The findings displayed in Table 16 show the amount of variance accounted for by the two categories whose significance was low enough ($p < .05$) for them to be entered into the regression equation.

Table 16. Stepwise regression effects of distance teaching variables on willingness to engage in distance teaching: total sample

Independent Variable	Cumulative R Square	F-Value	Signif. F	Variable's Coefficient (B)
Control over the teaching-learning process	.382	39.64	.00	.123
Use of technology for instruction	.436	24.33	.00	.076

Thirty-eight percent of the variance of faculty members' willingness to distance teach is explained by their perceptions regarding distance teaching's effect on control over the teaching-learning process. The variable has a positive coefficient (B), indicating that the more willing a faculty member is to teach at a distance, the less she or he perceives distance instruction as lessening teacher control over the teaching-learning process. An additional 6% of the variance is accounted for when faculty attitude towards the use of technology for instruction is combined with perceptions of distance teaching's effect on control over the teaching-learning process. The second variable also has a positive coefficient, indicating that faculty willing to distance teach

have more positive viewpoints on the use of technology for instruction. Together, the two variables account for 44% of the total variance. No other variable category (awareness, quality, nor institutional support) has a low enough probability to enter the regression equation. Consequently, they do not make an additional contribution to explaining the variance in the dependent variable.

The findings from the regression equation support Hypothesis 1--that the perceptions regarding control over the distance teaching-learning process significantly affect faculty willingness to distance teach. Hypothesis 2, however, must be rejected, as control over the teaching-learning process is not the only factor having a predictive relationship on willingness to distance teach. Perceptions regarding the use of technology for instruction also significantly affect faculty willingness to distance teach.

The same stepwise regression equation was also run on the two halves of the sample--Group A faculty (experienced in distance teaching) and Group B faculty (not experienced in distance teaching). The results for experienced faculty (Group A) were almost identical to those found for the total sample. They also support Hypothesis 1 while rejecting Hypothesis 2. Table 17 shows these results.

The results for Group B, however, lean even more heavily toward the variable of control over the distance teaching-learning process. This was the only variable usable in the stepwise regression procedure for the inexperienced group. For Group B, perceptions regarding control over the teaching-learning process alone account for 39% of the

variance. No other category for this group of faculty can account for any additional portion of the variance. Hence, for the variables covered in this study, perceptions regarding control over the teaching-learning process in distance instruction are the sole dominant influence on willingness to engage in distance teaching for faculty who have not taught in that format. Group B results support not only Hypothesis 1 but also Hypothesis 2. Specifics for Group B appear in Table 13.

Table 17. Stepwise regression effects of distance teaching variables on willingness to engage in distance teaching: Group A

Independent Variable	Cumulative R Square	F-Value	Signif. F	Variable's Coefficient (B)
Control over the teaching-learning process	.359	26.98	.00	.110
Use of technology for instruction	.434	18.00	.00	.083

Table 18. Stepwise regression effects of distance teaching variables on willingness to engage in distance teaching: Group B

Independent Variable	Cumulative R Square	F-Value	Signif. F	Variable's Coefficient (B)
Control over the teaching-learning process	.389	8.91	.01	.145

To further explore the first two hypotheses, post hoc stepwise multiple regression analyses, pitting each individual item in the survey against willingness to distance teach, were also completed. This procedure was done for the total sample as well as for each of the two groups. Results for the total sample appear in Table 19.

Six items working together accounted for 42% of the variance of the dependent variable (willingness to distance teach). Question 4.6, which can be rephrased as "How comfortable for you to use are distance teaching telecommunications technologies?" accounts for 22% of the variance alone. The item has a positive coefficient (B), indicating that the more comfortable faculty are with telecommunications technologies the more willing they are to distance teach. The second item in the regression equation is question 6.2, "Changing some of my teaching techniques to fit distance teaching limits my control over the course." It also has a positive coefficient, indicating that the less the faculty members perceive that changing their teaching to fit distance instruction limits their control over the course, the more willing they are to distance teach. Together, the first two items account for 32% of the variance in the dependent variable. Four remaining items can be forced into the equation, accounting for an additional 10% of the variance.

The first item in the regression equation is from the category regarding the use of technology for instruction. The second item and the fourth items (questions 6.2 and 6.6) are from the control over the distance teaching-learning process category. These results parallel

Table 19. Stepwise regression effects of individual survey items on willingness to engage in distance teaching: total sample

Independent Variable	Cumulative R Square	F-Value	Significance F	Variable's Coefficient (B)
Item 4.6 "On a 'comfortable. . . uncomfortable' continuum, how comfortable for you to use are distance teaching telecommunications technologies?"	.217	29.80	.00	.607
Item 6.2 "Changing some of my teaching techniques to fit distance teaching limits my control over the course."	.319	25.38	.00	.458
Item 3.5 "Distance teaching technologies provide more resources for students than many methods of classroom teaching can."	.372	21.50	.00	.320
Item 6.6 "There is too much involvement on the part of nonteaching administrative staff in the planning and delivery of distance teaching courses."	.392	17.79	.00	.261

Item 1.3 "On a 'never . . . often' continuum, how often have you talked with other faculty and staff about what it is like to teach through telecommunications technologies?"	.406	15.23	.00	.220
Item 3.6 "There are many problems with scheduling and logistics in distance teaching."	.417	13.42	.00	.196

the regression equation by category that was run on the total sample, as shown in Table 16, where those two categories accounted for 42% of the variance in willingness to distance teach. The remaining questions are from the quality category (item 3.5), the awareness category (item 1.3) and the logistics category (item 3.6). Overall, the item-by-item regression equation indicates that comfort with distance teaching technologies, lack of concern about having to adapt teaching techniques or with the involvement of nonteaching staff, believing that telecommunications technologies can provide additional resources to students, tending to talk more frequently with colleagues about the experience of distance teaching, and relative lack of concern about scheduling or logistics problems are collective predictors of willingness to engage in distance teaching.

Results of the post hoc individual-item regression analysis for Group A (faculty experienced in distance teaching) appear in Table 20. Four items working together account for 42% of the variance. The first item, question 6.2, "Changing some of my teaching techniques to fit the requirements of distance teaching limits my control over the course," accounts for 27% of the variance on its own. This is an item from the control over the teaching-learning process category.

Question 7.3, which can be rephrased as "How often do Area Extension staff provide sufficient assistance to distance instructors?", is from the staff services category and is the second item that can be forced into the equation. Together, the first two items account for 34% of the variance. Question 7.3, however, has a negative coefficient,

Table 20. Stepwise regression effects of individual survey items on willingness to engage in distance teaching: Group A

Independent Variable	Cumulative R Square	F-Value	Significance F	Variable's Coefficient (B)
Item 6.2 "Changing some of my teaching techniques to fit the requirements of distance teaching limits my control over the course."	.266	19.84	.00	.631
Item 7.3 "On a continuum of 'always . . . never,' how often to Area Extension staff provide distance instructors with sufficient assistance?	.335	14.07	.00	-.413
Item 1.1 "On a 'never . . . often' continuum, how often have you talked with other faculty and staff about distance teaching programs at Iowa State?"	.393	12.24	.00	.332
Item 4.7 "On an 'appropriate . . . inappropriate' continuum, how appropriate is the use of ISU resources for distance teaching?"	.419	10.36	.00	.356

indicating that faculty who are more willing to distance teach are less likely to feel that Extension field staff provide sufficient assistance to instructors.

Item 1.1, an awareness question, and item 4.7, a use of technology for instruction question, can be forced into the regression equation to account for an additional 8% of the variance of the willingness to distance teach variable for the experienced group. The addition of these two questions indicates that experienced faculty who are willing to distance teach talk more about ISU distance education programs with their colleagues, and are more likely to feel that distance teaching expenses are an appropriate use of university resources.

Results of the post hoc individual-item regression analysis for Group B (faculty not experienced in distance teaching) appear in Table 21. Questions 7.1 through 7.6 were omitted from this analysis, as so many of the inexperienced faculty members did not respond to those items. Questions 7.1 through 7.6 asked for opinions on assistance provided by ISU staff for those engaging in distance teaching.

With inexperienced faculty, four items working together account for 35% of the variance in their willingness to distance teach. Two of the items--items 3.5 and 3.7--are related to the quality of distance instruction. Item 3.7 accounts for 18% of the variance on its own and indicates that the more instructors feel distance teaching increases their listening and communication skills, the more willing they are to teach at a distance. The second item that can be forced into the regression equation--item 6.7--is a control over the teaching-learning

Table 21. Stepwise regression effects of individual survey items on willingness to engage in distance teaching: Group B

Independent Variable	Cumulative R Square	F-Value	Significance F	Variable's Coefficient (B)
Item 3.7 "Instructors are likely to become better listeners and communicators from teaching via audio teleconferencing or satellite."	.181	12.30	.00	.665
Item 6.7 "Faculty have as much control over distance teaching courses as they do over regular courses."	.284	11.11	.00	.447
Item 3.5 "Distance teaching technologies provide more resources for students than many methods of classroom instruction can."	.321	9.05	.00	.310
Item 4.5 "On an 'informative . . . uninformative' continuum, how informative are distance teaching telecommunications technologies."	.350	7.87	.00	.323

process item: "Faculty have as much control over distance teaching courses as they do over regular courses." An additional 10% of the variance is explained when this item works in conjunction with the one on instructor listening and communicating skills.

Beliefs that distance teaching technologies are informative (item 4.5) and can provide additional resources to students as compared to classroom instruction (item 3.5) are additional positive predictors of inexperienced faculty willingness to distance teach.

The logistics category was not included in the regression equations that used categorical scores as variables (Tables 16, 17 and 18). The items did not work together well as a group; hence, the category was not reliable.

Of the five items in the category, two items, 2.3 and 3.6, received Pearson correlation coefficients below .500 (see Table 15). Item 2.3, in particular, received a Pearson correlation coefficient of only .275, indicating that instructors' viewpoints on having to spend attitional time preparing distance instruction do not correlate highly with their viewpoints on equipment or scheduling problems or commuting to off-campus sites. The Cronbach alpha measure of reliability yielded a .231; even removing the two low-validity items only raised the alpha to .433.

Although the items group in this study into a category titled "Logistics" are measuring something, just what they are measuring is not clear from the available data. There were five items in the category: item 2.1 (How important is not having to commute to off-campus sites in your decision to distance teach?), item 2.2 (How important

is the gaining the flexibility of meeting with students individually by telephone in your decision to distance teach?), item 2.3 (How important is having to spend additional time planning and preparing distance teaching coursework in your decision to distance teach?), item 3.1 (There are many problems with equipment in distance teaching), and item 3.6 (There are many problems with scheduling and logistics in distance teaching).

Even though the category as a whole was deleted from the categorical regression analyses, the individual logistics items were included in the item-by-item regression analyses (Tables 19, 20 and 21). Only one item from the category was able to be forced into a regression equation: item 3.6 was entered on step six of the equation run on the total sample (Table 19).

Hypothesis 3

Hypothesis 3 further explores relationships between the control of the teaching-learning process category and willingness to distance teach. This hypothesis reads:

> H3 Faculty not experienced in distance teaching who indicate reluctance to initiate participation in it will rate those factors relating to control of the teaching-learning process significantly less positive than will faculty willing to distance teach.

The t-test of independent samples was used to test this hypothesis, comparing means on the control of the teaching-learning process category. Group 1 of the t-test is composed of faculty (both experienced and inexperienced) who indicated willingness to distance teach.

Willingness to distance teach was defined as choosing response "a" or "b" to item #8 on the survey instrument. There were 64 such respondents. Group 2 of the t-test is composed of those faculty neither experienced in distance teaching nor willing to try it. Not willing to try distance teaching was defined as selecting response "d" or "e" to item #8. Seventeen inexperienced faculty indicated unwillingness to distance teach. The alpha level (2-tail probability) was set at .05.

Results of the t-test are shown in Table 22. There was no significant difference in the variance of the two groups ($F = 1.19$, $p < 0.599$). Therefore, the pooled estimate of variance was used. Group 1 had a higher mean score (3.50) than Group 2 (2.81). The t-value is significant at the .000 level, indicating that inexperienced faculty unwilling to distance teach are significantly more convinced, than are faculty willing to distance teach, that distance teaching reduces instructor control over the teaching-learning process. Hypothesis 3 is supported with the data available from this study, although the support for the hypothesis would be stronger if Group 2 contained a larger number of respondents and if the two groups were more equal in size.

Table 22. T-test comparison of perceptions regarding control over the teaching-learning process between faculty willing to distance teach and inexperienced faculty not willing to distance teach

Group	n	Mean	F-Value	Pooled Variance		df
				t-value	2-tail prob.	
Group 1	64	3.499	1.19[a]	3.78	0.000	79
Group 2	17	2.812				

[a] $p < .599$.

Hypotheses 4 and 5

Hypotheses 4 and 5 explore relationships between institutional support and participation in distance teaching. These hypotheses read as follows:

H4 Faculty indicating willingness to initiate or continue with participation in distance teaching will rate those factors relating to institutional administrative support significantly more positively than will faculty indicating reluctance to initiate or continue with distance teaching.

H5 Faculty experienced in distance teaching who indicate willingness to continue participation in distance teaching will rate those factors relating to institutional staff services significantly more positively than will experienced faculty who indicate unwillingness to continue with distance teaching.

T-tests were used to test both hypotheses. For Hypothesis 4, the statistical test compared means on the institutional support-- administrative services category. Group 1 was composed of all faculty willing to distance teach and Group 2 was composed of all unwilling faculty. As in the previous t-test, willing faculty are those who indicated response "a" or "b" to item #8 on the questionnaire, and unwilling faculty are those who chose response "d" or "e" to that question. The alpha level was set at .05.

Results of the t-test appear in Table 23. The pooled variance estimate was used since there was no significant difference in the variance of the two groups ($F = 1.63$, $p < 0.129$). Although Group 1 had a slightly higher mean (2.79) than Group 2 (2.70), the resulting t-value of .52 with 86 degrees of freedom was not significant at the .05

level. Faculty willing to teach at a distance and faculty unwilling to distance teach did not significantly differ in their perceptions as to the degree of support provided for distance teaching by administrators and colleagues. The results indicate rejection of Hypothesis 4.

Table 23. T-test comparison of perceptions regarding institutional administrative support between faculty willing to distance teach and faculty not willing to distance teach

Group	n	Mean	F-Value	Pooled Variance		df
				t-value	2-tail prob.	
Group 1	64	2.792	1.63[a]	0.52	0.601	86
Group 2	24	2.704				

[a] $p < .129$.

The t-test for Hypothesis 5 compared means on the institutional support--staff services category. This time, Group 1 was composed of experienced faculty willing to continue to distance teach and Group 2 was composed of experienced faculty unwilling to continue with distance teaching. The alpha level was set at .05. Group 2 turned out to have an n of only 7, as so few of the experienced faculty indicated unwillingness to continue with distance teaching. Therefore, results from this t-test cannot be considered to be statistically significant.

Table 24 shows results of the test. The pooled estimate of variance would be used ($F = 2.10$, $p < 0.152$). Although the two groups show a very slight difference in means, the difference was in the opposite direction anticipated. Group 1's mean (4.04) is actually a bit lower than Group 2's mean (4.10). A negative t-value of -0.18

results, but it is not significant at the $p < .05$ level. While results of the t-test would indicate rejecting Hypothesis 5, a larger sample for Group 2 would need to be secured before any test results could be considered conclusive. Hypothesis 5 can neither be rejected nor supported with the data available.

Table 24. T-test comparison of staff services ratings between experienced faculty willing to distance teach and experienced faculty not willing to distance teach

Group	n	Mean	F-Value	Pooled Variance		df
				t-value	2-tail prob.	
Group 1	39	4.038	2.10[a]	-0.18	0.861	44
Group 2	7	4.095				

[a] $p < .152$.

Descriptive Results

Category means

Table 25 compares the overall means by category for Group A (faculty experienced in distance teaching), Group B (faculty not experienced in distance teaching) and for the total sample. The range of possible means would be 1.0 to 5.0; with 1.0 indicating a very negative viewpoint toward the particular aspect of distance teaching the category represents, and 5.0 indicating a very positive viewpoint.

Table 25. Category means for Group A (experienced faculty), Group B (inexperienced faculty) and the total sample

Category	Group A Mean n=53	Group B Mean n=52	Total Sample Mean n=105
Awareness of the field of distance teaching	2.487	1.859	2.176
Logistics of distance teaching	3.037	2.934	2.986
Quality in distance education	2.981	2.875	2.929
The use of technology for instruction	3.477	2.937	3.210
Control over the distance teaching-learning process	3.452	3.092	3.274
Administrative support for distance teaching	2.801	2.947	2.872
Staff services for distance teaching	4.079	3.760	4.002

Group A, the experienced group, consistently rated the factors higher than Group B, the group not experienced in distance teaching. The lowest total sample mean is 2.2, reflecting faculty members' rating of their own level of awareness of the field of distance teaching. This is also the lowest mean for both subgroups. The second lowest mean for the experienced subgroup and the total sample is the rating of administrative support for distance teaching. The inexperienced subgroup rates quality in distance education as their next-to-lowest category. Staff services provided to distance instructors achieve the

highest overall mean for all three groups. The degree to which instructors retain control over the teaching-learning process in distance instruction receives the second highest mean for the inexperienced subgroup. Distance teaching-experienced faculty rate the use of technology for instruction and control over the teaching-learning process as their second highest categories.

Willingness to distance teach

More of the responding faculty members are willing to distance teach than are unwilling. Sixty-one percent of the total sample responded "Quite willing" or "I might be interested" to item 8 on the questionnaire. Fourteen percent are undecided, and twenty-five percent responded "Probably not" or "Definitely not." Faculty who have already taught at a distance are more willing to do it again, than faculty who have not distance taught are to try it for the first time. Seventy-six percent of the distance teaching-experienced faculty indicated willingness, as compared to 46% of the inexperienced faculty. Table 26 shows faculty responses to item #8 for Group A (faculty experienced in distance teaching), Group B (faculty not experienced in distance teaching) and for the total sample. The statistical significance of faculty members' willingness to distance teach as a function of their ratings of some of the elements of distance teaching has been explored in this study through the testing of several hypotheses, as demonstrated earlier in this chapter.

Table 26. Responses to "How willing would you be to instruct an ISU distance teaching course this year or next?"

Group	Quite Willing	Maybe	Not Sure	Probably Not	No
Group A	31 (58.5%)	9 (17.0%)	4 (7.5%)	7 (13.2%)	2 (3.8%)
Group B	10 (19.2%)	14 (26.9%)	11 (21.2%)	9 (17.3%)	8 (15.4%)
Total Sample	41 (39.0%)	23 (21.9%)	15 (14.3%)	16 (15.2%)	10 (9.5%)

Written comments

Most of the comments written on the survey instrument by faculty were explanatory in nature--elaborating as to why they answered a particular question in a particular way. In the institutional support section (item 5), however, a number of negative comments were received regarding the effect participation in distance teaching has on promotion and tenure review. For example, when asked to indicate how much support promotion and tenure practices lend to participating in distance teaching, one respondent chose the response "no support," and then added: "It's worse than that: it probably hurts [one's chances for promotion-tenure]." In addition, a number of negative comments were received about the lack of adequate overload pay for distance teaching.

Cross-tabulations

Because the data collected span four different modes of distance instruction, a number of cross-tabulations were run to ascertain whether responses from experienced faculty to some of the key questions in the survey varied according to the mode of course delivery they have experienced. Due to the size of the sample, the numbers in the cells are too small to support statistical analysis. However, in a few cases, some patterns emerge through observation of the cell distributions.

Table 27 displays the result of crossing experienced faculty's responses to item #8 (willingness to distance teach) with distance teaching mode. The n numbers across the top of the table show the total number of responses by column, and the n numbers down the right hand side of the table show the total number of responses by row. Telecourse instructors appear to be less willing to continue teaching at a distance (almost 25% say "probably not" or "no") than videotape, satellite or audioteleconferencing instructors.

Table 27. Cross-tabulation of willingness to continue to distance teach by distance teaching mode

Teaching Mode Instructors	Quite Willing to Distance Teach Again (n=31)	Maybe (n=8)	Not Sure (n=4)	Probably Not (n=7)	No (n=2)
Videotape	12	2	1	1	1 (n=17)
Satellite	7	1		1	(n=9)
Audio	5	2		2	(n=9)
Telecourse	7	3	3	3	1 (n=17)

Table 28 displays the result of crossing experienced faculty's responses to item 6.7 (faculty control over distance teaching courses) with distance teaching mode. Again, the n numbers across the top of the table show the total number of responses by column while the n numbers down the right hand side of the table show the total number of responses by row. Here, telecourse instructors appear to feel they have less control over the distance learning courses they teach than do videotape, satellite or audioteleconferencing instructors.

Table 28. Cross-tabulation of responses to the statement "Faculty have as much control over distance teaching courses as they do over regular courses" by distance teaching mode

Teaching Mode Instructors	Strongly Agree (n=4)	Agree (n=23)	? (n=10)	Disagree (n=10)	Strongly Disagree (n=3)	
Videotape	2	9	2	1	2	(n=16)
Satellite		4	2	2	1	(n=9)
Audio	1	6	1	1		(n=9)
Telecourse	1	4	5	6		(n=16)

Table 29 displays the result of crossing experienced faculty's responses to item 3.3 (quality of distance teaching courses) with distance teaching mode. A less clear pattern emerges here, except that telecourse and satellite instructors appear to feel less positive about the quality of their courses than do videotape or audioteleconferencing instructors. As mentioned earlier, however, all of the cross-tabulations shown can only hint at possible patterns across distance teaching

telecommunication modes; the sizes of the samples are too small to achieve any statistically meaningful result.

Table 29. Cross-tabulation of responses to the statement "ISU distance teaching courses are of comparable quality to ISU on-campus courses" by distance teaching mode

Teaching Mode Instructors	Strongly Agree (n=5)	Agree (n=18)	? (n=12)	Disagree (n=14)	Strongly Disagree (n=3)	
Videotape	4	6	2	4	1	(n=17)
Satellite		2	2	4	1	(n=9)
Audio	1	6	2			(n=9)
Telecourse		4	6	6	1	(n=17)

Cross-tabulations were also carried out comparing willingness to distance teach with the demographic variables of sex, salary, professorial rank, teaching discipline, years employed by ISU, tenure status, and whether overload pay was received for teaching at a distance. No particular patterns emerged from those calculations. A tabulation was also done crossing teaching discipline with responses to the question "Distance teaching is appropriate for the subject matter I teach" (item 4.4); again, the numbers in the cells are too scattered and too small to indicate any discernible pattern.

Summary

Hypothesis 1 is supported. It states that there is a predictive relationship between faculty willingness to distance teach and faculty

perceptions regarding control over the distance teaching-learning process. Results indicate that the more willing a faculty member is to engage in distance instruction, the less she or he perceives distance teaching as lessening instructor control over the teaching-learning process. This hypothesis is supported by the total sample and by both subgroups--faculty experienced in distance teaching and faculty not experienced in distance teaching.

Hypothesis 2 is supported by the inexperienced faculty subgroup, but rejected by the experienced faculty subgroup and by the total sample. H2 states that perceptions regarding control of the distance teaching-learning process will be the only factor predicting willingness to engage in distance teaching. For faculty who are not experienced in teaching at a distance this hypothesis is supported. For faculty who have taught at a distance, however, and when both subgroups are combined, the hypothesis is rejected because an additional factor--that of using technology for instruction--is an additional significant predictor of willingness to participate in distance teaching.

There are significant differences in the way faculty not experienced in and not willing to try distance teaching, and faculty willing to distance teach, perceive distance instruction's effect on instructor control over the teaching-learning process. As stated in Hypothesis 3 and supported by the data, inexperienced, unwilling faculty see distance teaching as significantly lessening the instructor's control over the teaching-learning process.

Turning from the issue of control to the issue of administrative support for distance instruction, Hypothesis 4 states that faculty willing to teach at a distance perceive institutional support as significantly stronger than faculty not willing to teach at a distance. This hypothesis, however, is not supported by the data.

Data are inadequate to either support or reject Hypothesis 5. Although the available data indicate no significant difference in the way faculty willing to distance teach and faculty unwilling to distance teach rate staff services, sample sizes are too small to provide definitive results.

Comparison of category means indicates positive faculty attitudes on staff support services with relatively low ratings for awareness of distance teaching opportunities. Cross-tabulations indicate some patterns of difference across telecommunications modes, but are not statistically meaningful due to small sample sizes. A more thorough discussion and analysis of the study's results appears in the next chapter.

CHAPTER V. SUMMARY, DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS

Summary of the Research Study

The literature on distance teaching documents a tremendous growth in the quantity of distance education programming over the past decade. It also gives evidence of ongoing growth in the adult student cohort participating in distance learning. To meet the growing demand for academic coursework offered at a distance from the nation's campuses, increasing numbers of faculty members will be needed to teach at a distance. Yet the literature related to distance instruction is largely a chronicle of faculty resistance to teaching via instructional technologies. It is this contra-indication in the literature--a growing use of and need for distance teachers, yet documented resistance to telecommunications teaching by current instructors--that prompted this study.

Why do instructors resist distance teaching? And what has motivated those who are participating to try it? The answers to these questions are becoming increasingly important to growing numbers of distance education coordinators and administrators responsible for engaging talented faculty members in the art and practice of distance instruction. The literature provides no hard data to answer these questions. It does, however, yield some descriptive information on factors affecting faculty attitudes towards distance teaching. For this study,

the descriptive elements were lifted from the literature and reformulated into items on a questionnaire. The items were then classified into six categories:

1. Awareness of distance teaching,
2. The use of technology for instruction,
3. Logistical aspects of distance instruction,
4. Quality in distance teaching,
5. Instructor control over the distance teaching-learning process, and
6. Institutional support for distance instruction.

The purpose of the study was to statistically measure which of the items/categories most strongly influenced faculty members' participation in distance education. Two specific research questions, drawn from Robert Heinich's (1984) theory of instructional technology's effect on the traditional teaching role, focused the study. They were: (1) Do instructors primarily resist distance teaching because the process of teaching via instructional technology is perceived as lessening their control over the teaching-learning process? and (2) Does institutional support constitute the strongest catalyst for participation in distance teaching?

Methodology

The population studied consisted of the Iowa State University teaching faculty. All those faculty who had taught at least once at a distance either by satellite, audioteleconferencing, videotape, or

pre-produced telecourses comprised half of the sample for the study. The other half of the sample consisted of a random selection among the remaining faculty: those who have never taught at a distance. In total, the sample included 139 faculty. A questionnaire was sent to all 139 subjects of which 76% were returned and usable. Pearson correlation coefficients and Cronbach alpha calculations identified validity and reliability for the instrument. The logistics category was not used in some of the statistical calculations due to its low reliability. Of the 105 instructors responding, 53 had experience in distance teaching and 52 did not. A comparison of the demographic variables of gender, tenure status, annual salary, professorial rank, and years at Iowa State University showed the two halves of the sample to be comparable.

Respondents were asked to rate the importance of various distance teaching factors on a "1" to "5" continuous scale. Ratings were tabulated so that higher scores indicated more positive attitudes towards distance teaching and lower scores indicated more negative viewpoints. The results of the faculty members' ratings were compared to their indication of their own willingness to begin or continue with distance teaching. It was hypothesized that the subjects would rate those elements relating to a lessening of instructor control over the teaching-learning process as the most negative influence on their willingness to distance teach. It was further hypothesized that the faculty members would rate institutional support of distance teaching as a significant, positive influence on their willingness to teach at a distance.

Stepwise multiple regressions, t-tests, cross-tabulations, and frequencies were the statistical process used to analyse the data.

Results of the study

More faculty indicated willingness to continue with or to try distance teaching (61%) than indicated unwillingness to teach at a distance (25%). However, while three-fourths (76%) of the distance teaching-experienced faculty were willing to continue to teach at a distance, fewer than one half (46%) of the inexperienced faculty members were willing to try it. Distance teaching-experienced faculty rated staff services provided for distance instruction (a subset of the institutional support category) and the use of technology for instruction the most positively across categories. Inexperienced faculty rated staff services and instructor control over the distance teaching-learning process the most positively. Experienced faculty rated their own level of awareness of the field of distance teaching and administrative support for distance instruction the most negatively, while the two categories receiving the most negative responses from inexperienced faculty were level of awareness of the field of distance teaching and quality of distance education.

Overall, multiple regression analyses identified the issue of instructor control over the distance teaching-learning process as the greatest predictor of willingness to distance teach. For inexperienced faculty, control was the only category accounting for variance in the willingness to distance teach variable. For experienced faculty, and

for the total sample combining experienced and inexperienced faculty, a secondary predictor emerged: the category of use of technology for instruction.

Stepwise multiple regression on an item-by-item basis yielded four specific item predictors of willingness to distance teach for the inexperienced group of faculty. Instructor control over distance teaching courses, perception of distance teaching technologies as informative and as allowing for the provision of additional resources to students, and the belief that live audio or satellite teaching improves instructor listening and communicating skills combined to account for 35% of the variance on the willingness scale.

For experienced faculty, comfort with changing teaching techniques to fit distance instruction, support from Extension field staff, awareness of ISU distance education programs, and the belief that it is appropriate for university resources to be used for distance teaching emerged as predictors of willingness. Together, the four items accounted for 42% of the variance in experienced faculty members' willingness to continue to distance teach.

Data were insufficient to determine whether experienced faculty differed in their opinions of staff services depending on whether they were willing to distance teach again. No significant difference was found in opinions on [illegible] nistrative support between faculty willing to distance teach (regardless of experience or inexperience with distance instruction) and faculty unwilling to.

Willing (to distance teach) faculty and inexperienced, unwilling faculty did, however, differ significantly in their opinions on instructor control over the teaching-learning process. The inexperienced, unwilling faculty felt significantly more strongly that teaching at a distance would reduce their control over the teaching-learning process.

Cross-tabulations of willingness to distance teach with demographic variables yielded no definitive patterns. Crossing modes of instruction (videotape, satellite, telecourses, audioteleconferencing) with willingness, with course quality, and with instructor control, on the other hand, suggested that opinions on these issues may vary by telecommunications delivery mode. Sample sizes were too small, however, to discuss results conclusively.

Respondents were invited to add written comments to the questionnaire. Most of the comments received were explanatory in nature and did not yield additional insights on attitudes towards distance teaching. However, two negative themes did emerge from the written comments: the pay provided for distance teaching is inadequate and participation in distance teaching not only does not contribute positively to promotion and tenure assessment but may, indeed, actually be a handicap in that area.

Discussion of Study Results

The purpose of this study was to identify when personal, operational and organizational factors revealed in the literature to date most strongly influence faculty members' participation in distance education.

Research question #1

The study was designed to answer the question: Do faculty primarily resist distance teaching because the process of teaching via instructional technology is seen as lessening instructor control over the teaching-learning process? Heinich (1984) suggests this is a primary reason for rejecting instructional technology. His proposition is supported by this research study as control over the teaching-learning process did, indeed, emerge as the factor most predictive of faculty willingness or unwillingness to engage in distance teaching.

For faculty experienced in distance teaching, control emerged as the dominant influence, and the use of technology for instruction emerged as a secondary influence. None of the other categories--quality issues, level of awareness, administrative support, staff services--accounted for variance on the willingness to distance teach variable. The item-by-item regression for this group also yielded a control item as the first predictor ("Changing some of my teaching techniques to fit the requirements of distance teaching limits my control over the course").

For inexperienced faculty, control over the teaching-learning process is an even greater determinant of participation in distance instruction. It is interesting that for this group issues surrounding the use of technology for instruction (Is technology personal, or impersonal? Can it instruct, or does it merely entertain?) do not emerge as predictors of willingness as they do for the experienced group.

Instead, inexperienced faculty focus almost exclusively on the issue of control over the distance teaching-learning process. The more they perceive distance teaching as lessening their control, the less willing they are to give it a try. On the item-by-item regression analysis, a control item ("Faculty have as much control over distance teaching courses as they do over regular courses") is entered on the second step of the equation for the inexperienced faculty group.

Although faculty opinion on control over the teaching-learning process clearly emerges as the strongest overall predictor of willingness to distance teach, it is interesting to note that the items in the individual-item regression analyses cross several categories. For example, the analysis run on the total sample actually spans five of the six different categories. Two control items, one quality issue, one awareness item and one use of technology for instruction elmeent combined to account for 42% of the variance in willingness to teach at a distance. This finding would seem to indicate that, although faculty opinions on a variety of issues related to distance instruction influence their decision to participate, the strongest overall predictor is the sum total of the perception of distance teaching as lessening or not lessening their control over the teaching-learning process.

It is interesting to note that absent in all three of the item-by-item regression analyses is item 3.2: "Students learn as well through distance teaching as they do in a traditional classroom setting." This quality question focuses on teaching output--i.e., the results of the instruction. What respondents in this study indicated affected

their willingness to teach, however, were questions focusing more on input--i.e., the provision of resources for students, adapting teaching techniques, etc. The faculty members' focus on input, rather than output, supports the perspective of needing to retain control over the teaching-learning process to be willing to teach at a distance.

Heinich (1984) states that attempting to attract faculty to the use of instructional technology by demonstrating how well technology effects student achievement has not been a successful approach. The results of this study, too, suggest that faculty members' opinions on how well students learn as a result of distance instruction (the output side of the teaching-learning process) are not significantly affecting their decision to distance teach or to not. What is affecting their decision to distance teach is the input side of the teaching-learning process: How much control they perceive they have over the planning of a course as well as the delivery of the course. This finding is also supported by the themes suggested in the cross-tabulations completed on distance teaching-experienced faculty data. In the cross-tabs, telecourse instructors were the least positive on continuing to teach at a distance of the four telecommunications modes surveyed. Telecourse instructors also indicated they felt they had less control over their distance learning courses than did videotape, satellite or audioteleconferencing instructors. And they, along with the satellite instructors, were less positive about the quality of their distance courses. Of the four technology modes, telecourses are the only ones

pre-produced by "outsiders;" the other three types of courses are instructor-created.

Research question #2

The second question researched by the study was: Does institutional support constitute the strongest catalyst for participation in distance teaching? This conjecture is also drawn from Heinich's (1984) theory. The institutional support category has two components: (a) administrative support and (b) staff services.

Data from the study are not strongly supportive of a positive answer to this research question. The regression analyses previously described indicated perceptions regarding control over the teaching-learning process as the strongest predictor of willingness to distance teach, not institutional support issues. Only one institutional support item emerged in the item-by-item analyses. T-test results showed no significant differences in the way willing and unwilling faculty perceive institutional support for distance teaching. Evidently, faculty are engaging in distance teaching regardless of their opinions on how well the institutional administrative structure encourages and rewards that participation. There is some evidence, too, that opinions on the amount of support shown by the institution are on the negative side. For example, several written comments were received on the lack of distance teaching's ability to support promotion and tenure bids. Also, experienced faculty (and the overall total sample) gave administrative support the second lowest mean of all the categories.

Results are inconclusive for the staff services component of institutional support. Staff services rated the highest mean of any category for both experienced and inexperienced instructors. However, a too-small sample size for one group inhibits conclusiveness. The slight difference in means that was observed (between faculty who had experienced distance teaching staff services and were willing to continue to teach and those who were not willing to continue) even leaned toward a negative relationship between staff services and willingness. Additional study in this area is needed in order to form any definitive conclusions.

Conclusions

If distance teaching is to continue to grow and to reach its full potential within continuing higher education, it will be necessary to develop a body of knowledge that adequately guides the direction of this type of instruction. This study initiated a body of knowledge measureing factors affecting faculty participation in distance teaching and can provide empirical evidence for recruiting teaching faculty into the practice of distance education. Specifically, this study was designed to examine the applicability of Heinich's (1984) theories on faculty resistance to instructional technology to the field of distance teaching.

It is clear from this study that full-time faculty employed at a major research institution are not choosing to participate in distance teaching based on a perception of strong administrative support for

distance instruction. Faculty who have chosen to teach via telecommunications technologies have done so in spite of their rather low opinion on institutional administrative support for their endeavors. Left open to question, then, is whether or not a promotion and tenure structure strongly encompassing distance teaching would significantly enhance faculty willingness to participate. This issue will increase in importance for those institutions actively seeking to expand their current distance teaching efforts.

What faculty members are basing their decision to distance teach on is their comfort level with the amount of control they have/will have over the teaching-learning process in distance education. Those faculty who see distance teaching as lessening their control over the course planning and execution processes are significantly less willing to engage in distance teaching than are faculty who are not concerned with distance instruction lessening their control.

It evidently takes some experience with the teaching technologies to be able to base one's decision upon them. For example, with experienced faculty, but not with inexperienced faculty, perceptions as to the positive or negative effects the use of technology has on instruction serve as a secondary predictor to willingness to continue to distance teach.

Outsider pre-produced, as opposed to faculty-created, telecourse and other learning materials could be perceived by faculty as lessening instructor control over the teaching-learning process, as well as being indicators of the quality of a distance teaching course. To the degree

that distance teaching coursework is seen as comparable to on-campus coursework, faculty members are willing to participate in distance teaching. "Comparable to" is evidently judged more on input factors (i.e., what the instructor does) than on output factors (i.e., student achievement).

Implications for Distance Teaching

For distance education administrators, this study gives an idea of the size of the pool of potential distance teachers in traditional universities. Almost half of the faculty who had not yet taught at a distance are willing to try it. In addition, three quarters of those who have participated in distance teaching are inclined to continue that participation.

Results of the study suggest that, under current conditions, successful recruitment of distance teaching instructors from the ranks of full-time teaching faculty may best be benefited by speaking to the concerns faculty members may have about losing control of the teaching-learning process in distance instruction. For example, the use of delivery modes and formats allowing for the greatest amount of faculty control ("candid classroom" videotaping as opposed to pre-produced telecourses, for example) may help to increase faculty participation. Also, increasing awareness of distance teaching and then allowing for self-selection on the part of faculty members may encourage those instructors who have the fewest concerns regarding loss of control of the teaching-learning process to come forward to participate.

Furthermore, instructional planning and execution that revolve around the prerogatives of the course instructor to the maximum degree possible may well help to minimize faculty resistance.

Continuing education administrators will also want to keep in mind the difference between inexperienced and experienced faculty members' opinions on technology affecting the instructional process. Inexperienced faculty are almost exclusively concerned with control over the teaching-learning process. Distance teaching-experienced faculty, on the other hand, see the use of technology for instruction as a co-determinant with control over the teaching-learning process in their willingness to continue distance teaching.

In addition, results of the study invite traditional institutions to look more carefully at how their current promotion and tenure practices do, or do not, reward participation in distance instruction. Implications from this study are that faculty currently are not expecting a high level of institutional reward for teaching at a distance (as evidenced by their low ratings of this category) and are thus basing their decision to distance teach or not to distance teach on other factors.

Recommendations for Further Research

1. Replication of the study is needed to document the significant differences between distance teaching categories and factors for willing and unwilling, and experienced and inexperienced faculty members. If the results corroborate this study's results, it will further

substantiate control of the teaching-learning process as the major factor affecting faculty willingness to distance teach.

2. Research further refining the instrument used in this project would also be of benefit to the study of faculty participation in distance teaching. Results of this study indicate some items as stronger predictors than others, as well as the possibility of some cross-over of items between categories. Further descriptive research is needed on faculty attitudes towards distance teaching in order to yield items and classification schemes that can then be used to become more sufficient measures of faculty response. The amount of unexplained variance in the regression equations used in this study is evidence of open territory for further distilling the known influences affecting an instructor's participation in distance teaching and the interactions of those influences.

3. Research is also needed on the ways that various telecommunications modes affect faculty perceptions of distance teaching, as well as on how the academic discipline the faculty member teaches affects willingness. Data in these areas from this study were insufficient to draw any conclusions.

4. Similarly, data were insufficient in this study to statistically measure administrative and staff services effects on faculty attitudes. Further research is needed to determine the impact of institutional support on faculty willingness to distance teach.

In summary, this study was concerned with faculty attitudes towards teaching at a distance. By applying statistical measurement to descriptive variables, the study has moved the literature in this area to a more advanced stage of development. The study has also generated baseline data that should provide opportunities for conducting theoretically relevant research in the future.

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I dedicate this work to my daughters Anne and Donna for all their support and assistance.

APPENDIX A. COVER LETTER TO FACULTY

Iowa State University of Science and Technology Ames, Iowa 50011

University Extension

December 3, 1986

Address reply to:

Office of Continuing Education—Credit Programs
102 Scheman Continuing Education Building
Ames, Iowa 50011
Telephone: 515-294-4750
Toll free in Iowa: 800-262-0015

Dear ISU Faculty Member:

I am a graduate student conducting research on faculty reactions to teaching via telecommunications systems. This letter invites you to assist me in discovering the factors involved in an instructor's decision to teach, or not to teach, off campus by way of telecommunications (distance teaching).

The survey is not a solicitation for distance teachers. Your name has either been acquired from an Office of Continuing Education list of faculty experienced in distance teaching, or randomly selected from a list of ISU teaching faculty. The enclosed questionnaire is for you, even if you have not taught off campus using telecommunications devices before.

A FEW POINTERS:

1) Please do not be concerned that you are not "typical" of teaching faculty. If you are not, your responses will allow me to detect the variety of perspectives among faculty.

2) I want to know what you think, not what you believe ISU teaching faculty "should" think or what you imagine I expect. I have no preconceptions about your ideas; I want to learn what they are.

3) The enclosed questionnaire may include some questions that "do not quite apply" to you. This is to be expected, since some questions are more relevant to some faculty members than to others. Nonetheless, I encourage you to respond to these questions anyway and to write comments in the margins that indicate how you have interpreted the question.

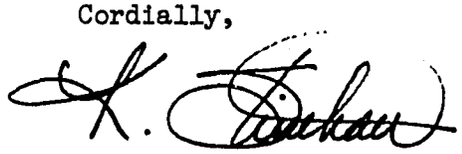
4) Some questions may ask you about things you have never thought about. On those questions, please think through what response comes closest to your views. If a questionnaire is thoughtfully written, it should be enlightening to the respondent, as well as to the researcher. I hope that in answering my questions you will enjoy discovering your own answers to many of them.

(over, please)

Please return your completed questionnaire in the enclosed envelope. The individual returns will be kept completely confidential, with results reported only in the aggregate.

If you have any questions about the survey please contact me at 294-4750. Thank you for your help!

Cordially,



Kathleen Stinehart

Enclosures

APPENDIX B. QUESTIONNAIRE

ISU FACULTY
DISTANCE TEACHING SURVEY

In this questionnaire the term "distance teaching" refers to off-campus teaching situations in which the instructor is geographically separated from the learners. In distance teaching, telecommunications devices are used to connect teachers with students who are at a distance from the campus.

Distance teaching takes one of four forms at Iowa State:

(1) Videotaped courses - class sessions taped live at ISU for subsequent viewing by groups of off-campus students;

(2) Television or "telecourses" - documentary-like lessons (produced by national organizations) broadcast to students over Iowa Public Television, and for which ISU-selected texts and assignments are mailed out to students for completion.

(3) Satellite courses - live ISU classroom instruction sent by satellite to distant classrooms which are equipped with a telephone for students to call in questions during the class.

(4) Audio teleconferenced (Telebridge or Telenet) courses - live classes conducted via telephone conference calls, and for which visual aids are mailed to students ahead of time. [No video is involved in audio teleconferenced courses.]

(Please continue on the back side of this page.)

2

1. In conversations with other faculty and staff, how often have you discussed

	Never				Often
. . . distance teaching programs at Iowa State?	1	2	3	4	5
. . . what other institutions are doing in the area of distance education?	1	2	3	4	5
. . . what it is like to teach through telecommunications technologies?	1	2	3	4	5

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2. How important (have) would the following be in your decision to participate in distance teaching?

	Unimportant				Important
. . . not having to commute to off-campus sites.	1	2	3	4	5
. . . the flexibility of "meeting with" students individually by telephone.	1	2	3	4	5
. . . having to spend additional time planning and preparing distance teaching coursework.	1	2	3	4	5

3. Please indicate if you agree or disagree with the following:

1 = if you strongly agree with the statement
2 = if you agree more than you disagree
3 = if you neither agree nor disagree
4 = if you disagree more than you agree
5 = if you strongly disagree

	SA	A	?	D	SD
There are many problems with equipment in distance teaching.	1	2	3	4	5
Students learn as well through distance teaching as they do in a traditional classroom setting.	1	2	3	4	5
ISU distance teaching courses are of comparable quality to ISU on-campus courses.	1	2	3	4	5
Students need better study skills for distance learning than they do for classroom learning.	1	2	3	4	5
Distance teaching technologies provide more resources for students than many methods of classroom instruction can.	1	2	3	4	5
There are many problems with scheduling and logistics in distance teaching.	1	2	3	4	5
Instructors are likely to become better listeners and communicators from teaching via audio teleconferencing or satellite.	1	2	3	4	5
Distance teaching promotes passivity on the part of the learner.	1	2	3	4	5
Pre-produced telecourse materials are usually of comparable quality to what is taught at ISU.	1	2	3	4	5

(over, please)

4

4. On the dimensions below, please indicate which point on the scale comes closest to characterizing how you view the use of telecommunications technologies for off-campus instruction.

(more personal, more uniting, etc.)						(more impersonal, more isolating, etc.)
personal	1	2	3	4	5	impersonal
uniting student & teacher	1	2	3	4	5	isolating student from teacher
familiar to me	1	2	3	4	5	unfamiliar to me
appropriate for the subject matter I teach	1	2	3	4	5	inappropriate for the subject matter I teach
informative	1	2	3	4	5	uninformative
comfortable for me to use	1	2	3	4	5	uncomfortable for me to use
represents an appropriate use of ISU resources	1	2	3	4	5	represents an inappropriate use of ISU resources
has immense teaching potential	1	2	3	4	5	possesses little such potential

5. How much support (in terms of encouragement and reward) do you think each of the following provide for ISU faculty participation in distance teaching?

	much support				no support
. . . your DEO	1	2	3	4	5
. . . your college Dean	1	2	3	4	5
. . . top administrators at Iowa State	1	2	3	4	5
. . . your colleagues	1	2	3	4	5
. . . financial compensation for distance teaching	1	2	3	4	5
. . . promotion and tenure practices	1	2	3	4	5
. . . professional recognition outlets (awards, publications, etc.)	1	2	3	4	5
. . . overall instructional climate at ISU	1	2	3	4	5
. . . the general mission of Iowa State University	1	2	3	4	5

(over, please)

6

6. Please indicate if you agree or disagree with the following:

1 = if you strongly agree with the statement
2 = if you agree more than you disagree
3 = if you neither agree nor disagree
4 = if you disagree more than you agree
5 = if you strongly disagree

	SA	A	?	D	SD
Not being able to see students while I am teaching makes (would make) me feel I am not as in control of my class.	1	2	3	4	5
Changing some of my teaching techniques to fit the requirements of distance teaching limits (would limit) my control over the course.	1	2	3	4	5
Planning distance teaching courses in cooperation with non-teaching administrative staff interferes (would interfere) with my prerogatives as course instructor.	1	2	3	4	5
Pre-produced distance teaching courses reduce (would reduce) my control over course content.	1	2	3	4	5
Teaching via telecommunications reduces (would reduce) my control over day-to-day instruction.	1	2	3	4	5
There is too much involvement on the part of non-teaching administrative staff in the planning and delivery of distance teaching courses.	1	2	3	4	5
Faculty have as much control over distance teaching courses as they do over regular courses.	1	2	3	4	5
Distance teaching threatens faculty jobs.	1	2	3	4	5
The climate for distance teaching at Iowa State is more supportive than it was 2-3 years ago.	1	2	3	4	5

7. Using the scale below, please indicate in the left column how often each of the staff listed provides sufficient assistance to faculty involved in distance teaching. In the right column indicate how often they are able to see distance teaching problems from the instructor's point of view.

1 = always 2 = usually 3 = occasionally
4 = rarely 5 = never 6 = do not know

PROVIDE(S) ME WITH SUFFICIENT ASSISTANCE							SEE(S) PROBLEMS FROM MY POINT OF VIEW					
1	2	3	4	5	6	Staff in the Office of Continuing Education -- Credit Programs	1	2	3	4	5	6
1	2	3	4	5	6	My college's continuing education coordinator	1	2	3	4	5	6
1	2	3	4	5	6	Area Extension staff	1	2	3	4	5	6

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8. How willing would you be to instruct an Iowa State University distance teaching course this year or next? (Circle one, please.) Note: Your anonymity is assured; you will not be contacted in regard to your response to this or any other question.

a. Quite willing.
b. I might be interested.
c. I'm not sure if I would be interested or not.
d. Probably not.
e. Definitely not.

(over, please)

9. There are a few facts I need to gather to complete the data base. I appreciate your responding to the following:

How many years have you been employed at Iowa State? _____ years

Please indicate your sex. (circle one)
a. female
b. male

Are you tenured? (circle one)
a. yes
b. no

When you teach (taught) via Telebridge, satellite, videotape or telecourse do you (did you) usually receive overload pay? (circle one)
a. yes
b. no

Thank you for your cooperation with this research project. I really appreciate your time and responses. Do add any comments you would like on this or other pages. Thank you!

Return to: Kathleen Stinehart, Office of Continuing Education-Credit Programs, 102 Scheman, ISU Ames, IA 50011

APPENDIX C. FOLLOW UP LETTER TO FACULTY

Iowa State University of Science and Technology Ames, Iowa 50011

University Extension

January 15, 1987

Address reply to:

Office of Continuing Education—Credit Programs
102 Scheman Continuing Education Building
Ames, Iowa 50011
Telephone: 515-294-4750
Toll free in Iowa: 800-262-0015

Dear ISU Faculty Member:

I have not heard from you as yet in terms of my dissertation questionnaire, so I am enclosing a second copy. I would like you to take a few minutes to complete the survey form and return it to me in the enclosed envelope. In doing so you will be assisting me in discovering the factors involved in an instructor's decision to teach, or not to teach, off campus by way of telecommunications systems (distance teaching).

This survey is not a solicitation for distance teachers. If you have not taught via telecommunications before, your name has been selected at random from a list of ISU teaching faculty. If you have participated in distance teaching your name was obtained from an Office of Continuing Education list. Either way, this questionnaire is for you, and your responses are important. Results will be reported only in the aggregate and individual responses will be kept entirely confidential.

A FEW POINTERS:

1) Please do not be concerned that you are not "typical" of teaching faculty. If you are not, your responses will allow me to detect the variety of perspectives among faculty.

2) I am interested in <u>what you think</u>, not what you believe ISU teaching faculty "should think" or what you imagine I expect. I have no preconceptions about your ideas; I want to learn what they are.

3) Some questions "may not quite apply" to you. This is to be expected, since some questions are more relevant to some faculty members than to others. Nonetheless, I encourage you to respond to these questions anyway and to write comments in the margins indicating how you have interpreted the question.

4) Some questions may ask you about things you have never thought about. On those questions please think through what response comes closest to your views. If a questionnaire is thoughtfully written, it should be enlightening to the respondent as well as to the researcher. I hope that in answering my questions you will enjoy discovering your own answers to many of them.

Please contact me at 294-4750 if you have any questions about the survey. Thank you!

Cordially,

K. Stinehart

Kathleen Stinehart

Enclosure